THE

ENTOMOLOGIST'S MONTHLY MAGAZINE:

CONDUCTED BY

C. G. BARRETT, F.E.S.
J. W. DOUGLAS, F.E.S.
W. W. FOWLER, M.A., F.L.S.
R. McLACHLAN, F.R.S.
E. SAUNDERS, F.L.S.
H. T. STAINTON, F.R.S.

VOL. XXIII.

> " The classifications of the naturalist define abruptly where Nature more or less blends. Our systems are nothing if not definite."—
>
> *Dr. Asa Gray.*

248871

LONDON:
GURNEY & JACKSON (Mr. Van Voorst's Successors),
1, PATERNOSTER ROW.
1886-87.

LONDON:

NAPIER, PRINTER, SEYMOUR STREET, EUSTON SQUARE.

MDCCCLXXXVII.

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THE

Entomologist's Monthly Magazine

VOLUME XXIII.

NOTES ON BRITISH *TORTRICES.*

BY CHAS. G. BARRETT, F.E.S.

(*Continued from Vol.* xxi, *p.* 126.)

Adverting to my remarks (Vol. xxii, pp. 1, 2) on the closely allied and difficult species of *Dichrorampha*, Gn. (*Dicrorampha* and *Endopisa*, Wilkinson), I have, I think, after much consideration, arrived at some sort of a satisfactory conclusion.

Out of the eight species or varieties there enumerated, I think that four species may be reliably distinguished. One of these—the 6th—is our well-known *plumbagana*, about which there is no question, and which seems to require no remark now.

No. 5—our commonest species, found almost everywhere in grassy places—is heavily weighted with names. It is certainly *ulicana*, of Wilkinson and Stainton, and, I think, without doubt, *blepharana*, H.-S. (197, 8), and *plumbana* of Heinemann. *Zachana*, Treitschke, appears to be a rather more pointed-winged species, but its markings would do for this or either of its allies, yet *ulicana* of Guenée was confessedly substituted for it. In fact, Guenée gave no description of *ulicana* at all. Scopoli's *description* of his *plumbana* is quite useless; in fact, he mentions "ferruginous spots," of which this species presents no trace, but the name *plumbana* seems to have been restored to it by Zeller, who had an opportunity of examining the (very rare) *plates* belonging to Scopoli's work, and must have found in them the necessary evidence. Under this name of *plumbana* the species is now generally known, and it seems unnecessary to object to it. It certainly has the merit of suitability.

The species—No. 1—which we had been accustomed to call *tanaceti*, until Mr. Warren unravelled the history of that name, and showed it to belong to the comparatively northern species which I had called *herbosana*, appears to agree sufficiently well with Guenée's description of *saturnana*, to which Heinemann and Wocke also refer it.

Anterior-wings above olivaceous, irrorated with yellow scales, as in *ulicana*, especially at the apex. A very faint dorsal spot and leaden lines, not blue, of which the first bounds a triangular speculum, as in *plumbana*. Four black spots before the leaden cilia, and the costa distinctly streaked with leaden. Hind-wings grey, with concolorous cilia.

I now think that my specimens (No. 3) from the Isle of Wight and Hungerford, Wilts, are merely small specimens of this species (indeed, they agree in size better with Guenée's description than does our ordinary form), and that those from Galway (No. 7) are darker specimens of the same.

For the species (No. 2) formerly mixed with the last, but having a distinct costal fold, of which I recorded specimens from the coast of Pembrokeshire, and at Plymouth, and which seems to occur along the south coast, I think that we may safely adopt the name of *senectana*, Guenée, which has been so long, doubtfully, included in our lists. Guenée seems to have disregarded the costal fold, but otherwise his description is sufficiently accurate.

Allied to *ulicana*, but larger and paler. Anterior-wings of the form of *caliginosana* (*simpliciana*), hoary grey, irrorated entirely with very numerous yellow scales, almost immaculate. A dorsal spot and marginal dots scarcely perceptible. Costa streaked with leaden. Cilia leaden, separated by a white line, as in *caliginosana*, and furnished with a little apical tooth. Hind-wings grey. Under-side of all the wings hoary, silky, with a greenish gloss.

To this it only seems necessary to add, "Costa folded in the male." To this species I think that my rather smaller specimens (No. 4) from Teignmouth and Darlington belong, and also the single specimen from Zeller (having Heinemann's label), which has the costal fold. The other two (No. 8) must be *saturnana*, Gn. Though yellower than our specimens, there is nothing to separate them specifically. Neither is there any very apparent distinction between *saturnana* and *senectana*, until under a magnifier the fold becomes visible. The folded costa produces a slight difference in shape, which is evidently referred to by Guenée when he writes, "Anterior-wings of the *form* of *caliginosana* "—a folded species. Heinemann includes *plumbana* and *saturnana* in his section of the genus *Dichrorampha*, which is without the fold.

When recently looking through Dr. Mason's magnificent collections at Burton-on-Trent, I found in his series of *Sericoris alternana* (*Daleana*), from Scotland, specimens deviating from the usual unicolorous type, in the direction of showing darker fasciæ across the anterior-wings, and others in which these markings were sharply and distinctly defined, agreeing exactly with types of *metallicana*, Hüb., formerly sent me by Professor Zeller.

The gradations in different specimens are so regular as to prove, in my opinion, beyond doubt, that our insect is only a local form of the widely distributed mountain-frequenting *metallicana*. This well-marked form is rather pretty, the markings, which are brownish-grey, consisting of a large basal blotch with sinuated margin, a central fascia with straight margins and nearly of a triangular shape, and another fascia in the form of a slender triangle across the apex. Hübner's figure 68 is sufficiently accurate, and was published thirty years before Curtis's name *alternana*—if even he had correctly described the species,—and Hübner's name, *metallicana*, must evidently be adopted for our insect. As already noted (Ent. Mo. Mag., vol. xi, p. 59), the name *Daleana*, still so commonly used in our collections, has really no foundation at all.

Antithesia fuligana, Hüb., *ustulana*, Haw.—When the specimens formerly noticed (vol. ix, p. 129) were reared from stems of *Stachys palustris* from Wicken Fen, the idea suggested itself that, from their shape, they must be distinct from the form found among *Stachys sylvatica* at the edges of woods and elsewhere in the south of England; but this view, in deference, I think, to the opinion of my friend Mr. Doubleday, was at that time suppressed. It has asserted itself from time to time since, and lately has been strongly urged upon me by Mr. Warren, who had personal acquaintance with the form found in the fens, and was much struck by the difference in shape of the fore-wings when he saw a fine series of the other taken in the London district. Still more recently, when engaged in examination of the structure of the genital sheaths of the males, I found conclusive structural evidence of their distinctness, and even of their belonging in this respect to different *groups* in the genus *Antithesia*.

Thus it has become necessary to ascertain to which of these species the name *fuligana* really belongs, and with the help of my kind friend Mr. Stainton, and his valuable library, I think I have worked this question out.

Hübner's figure 109 *(fuligana)* is clearly a rather large representation of our *southern* species (from *Stachys sylvatica*), as also is Herrich-Schäffer's figure under the same name, and for this species the name must be retained. *Ustulana*, Haw., is certainly the same species. He describes it:—

> Anterior-wings *obtuse*, obscure smoky, with base broadly black or deep black, *scorched*, with large, straight, obscure middle fascia, extreme hind-margin and cilia *scorched* black. Costa with two beautiful orange spots. Between the middle fascia

and the hind-margin, a faint square spot near the margin, and another at the anal angle, both grey, only visible in certain lights. Hind-wings and all the cilia, black.

The "scorched" appearance is produced by a delicate marbling of chestnut scales, and is very characteristic of this species, as distinguished from that found among *Stachys palustris.*

Wood's figure of *ustulana* (912) is more of the *shape* of the latter, but has a distinct round black spot in the sub-apical pale band, which does not belong to either, and seems to render it unrecognisable.

Under these circumstances, I think it will prevent confusion if we adopt the name *carbonana* of Doubleday's list for the fen species. This name is not, as far as I know, supported by any figure or description, but it has been very generally used in connection with these (combined) species, and may very well (and extremely suitably) be adopted for that now recognised and separated for, I believe, the first time. It may be described as follows:—

Carbonana (Dbld. list). Head black. Palpi and antennæ hoary grey, thorax dark grey, fore-wings rather narrow, with costal margin but little arched, and the hinder portion of the wing somewhat squared. Ground colour varying from very smoky whitish to blue-grey, basal blotch large, blackish, with indented, somewhat perpendicular, margin; central fascia rather narrow, perpendicular, deep black with the margins indented and irregular, often cloudy; just beyond and parallel with it is an elongated black blotch, and another merging into an obscure triangle on the anal angle; hind-margin and apex irregularly streaked with black; on the costa a few irregular black dots, from which run delicate lines into the paler space. Cilia dark grey, with a black line at their base. Hind-wings dark grey, cilia paler.

Among *Stachys palustris* in fens and marshes in June, the larva feeding in the stems in the autumn.

It is a very obscure smoky-looking species, distinguished from *fuligana* by its longer, more sharply squared, fore-wings, and the absence of the "scorched" markings; and from *marginana*, which it nearly approaches in shape and size, by its dark ground colour and ill-defined smoky markings, which also are differently placed, and by the dark hind-wings in both sexes.

London: *May* 12*th*, 1886.

NOTES ON THE OVA AND LARVÆ OF *BANKIA ARGENTULA*.

BY JOHN BROWN.

Chippenham Fen, Cambridgeshire, is one of our best localities for *B. argentula*; it occurs abundantly there the whole of the month of June. The date of my visit to this place was upon the 10th of June, 1884, for this species in particular, great numbers of which were taken not only by myself but by other entomologists who were there; many of my captured specimens deposited numerous ova in confinement, and it happened these were nearly all fertile and were reared through all stages without difficulty, appearing in perfect condition in the early part of June, 1885. In July, 1884, when these larvæ were approaching maturity I thought I would visit Chippenham Fen, hoping I might succeed in finding them upon their food-plants, and was not there very long before I found many larvæ full grown by shaking the high grass-stems into a little pointed frame covered with a thin white cloth; nearly all these changed to pupæ and came out perfect specimens at the same date as those bred from ova, June, 1885.

Description of ova.—The ova were deposited in single lines, being attached to each other, the first and last eggs were secured by claspers; form, oval; colour, pale yellow, transparent, and under high power perfectly smooth.

Larvæ.—When first hatched (7 days) they were little wriggling grey larvæ, and immediately commenced feeding upon under-side and parenchyma of the food plant; when touched or disturbed they fell suspended by threads in a manner peculiar to loopers; after the first moulting they assumed a green tint. In about three weeks, when full grown, these half-looper larvæ became pale green; head darker; a drab line down centre of back, a pale yellow line running parallel, and another line parallel not so distinct; the segments divided by horizontal lines of pale yellow accompanied by other lines but faintly marked. Length, ¾-inch or 9 lines.

Food plants.—Poa annua, aquatica, pratensis, and other grasses. Larva goes to earth for transformation, pupa being enclosed in a silken cocoon.

5, King's Parade, Cambridge:
April 6th, 1886.

NOTES ON THE VARIATION OF *LEPIDOPTERA* TAKEN NEAR DERBY.

BY JOHN HILL.

As I meet with varieties of some of the common *Lepidoptera* which do not appear to be general, perhaps a few notes on the different species occurring in this neighbourhood which vary, may be of interest to the readers of the Ent. Mo. Mag.

We are very poorly represented in butterflies, my own captures in the immediate neighbourhood (including *Colias Edusa*, which occurred pretty freely in 1877) amount to only eleven species; but the district is very prolific in moths, many of which are scarce.

Chrysophanus Phlæas.—I took one of the colourless variety in 1877, which I believe is in the collection of the late Rev. H. A. Stowell; the spots on the fore-wings of this insect vary in size.

Smerinthus populi.—I have a specimen with the russet spot on the under-wings wanting: also one of the brown variety with a lovely lilac bloom on the wings, bred this season; I only hope the bloom will last.

Hepialus hectus.—One with the silvery markings continued on the hind-wings. *H. velleda.*—This abundant insect is very variable. I have met with it of all shades, from the ordinary type to brown, with the lighter markings scarcely perceptible, and only a small white spot on the fore-wings (*v. carnus*).

Bombyx quercus.—Variety *callunæ* is common.

Odontoptera bidentata.—I often meet with very dark specimens of the male.

Crocallis elinguaria.—The band across the fore-wing of this insect varies very much in colour.

Phigalia pilosaria.—The markings on this insect vary very much, from that with the lines across the wings very distinct, to a sort of an olive colour without any markings. I have a specimen which has the wings very nearly black, with a narrow grey border on the hind margins.

Amphidasys betularia.—I have bred the black variety freely, and also intermediate varieties.

Boarmia repandata.—This varies very much; I have never met with the dark-banded form, but have a specimen of a sort of orange-brown colour without any of the lighter markings.

Tephrosia biundularia.—This is one of the most variable insects I meet with; it varies in all shades of colour, from the usual light type to nearly black, the ordinary form being the rarest; sometimes the darker forms will have a patch of the light grey colour on the hind-wings, and usually more on one wing than the other, generally the left hind-wing. My experience of this insect is that it is getting gradually darker year by year, especially in one of the woods. *T. punctulata.*—I have met with a nice dark banded form of this insect.

Ephyra punctaria.—I have one with the brown line across the wings very broad.

Eupisteria heparata.—This occurs from the ordinary colour to nearly black.

Fidonia piniaria.—I get both the northern and southern forms of the male, that is, both white and yellow ground colour, and the females varying from a bright yellow to brown and a dark smoky colour.

Hibernia progemmaria.—This varies to a very dark form.

Eupithecia lariciata.—I have a variety of this "pug" of quite a pale grey with a darker band round the hind margins of all the wings.

Thera variata.—I have bred some dark banded forms of this insect, but not so dark as some of the Scotch varieties.

Hypsipetes impluviata.—This insect varies from a light to very dark form. *H. elutata.*—This varies to rusty-brown and very dark brown.

Cidaria pyraliata.—I have met with some dark varieties of this insect.

Cymatophora duplaris.—Specimens of a very dark smoky-grey occur.

Bryophila perla.—Sometimes an ochreous form of this insect occurs, and also a dark variety.

Xylophasia rurea.—I have met with the light, dark, and an intermediate form of this common insect. *X. polyodon.*—Nearly every season I meet with dark varieties of this insect, almost as dark as the Scotch forms, but they are very rare.

Noctua festiva.—I have bred specimens of this insect that I really cannot distinguish from some specimens I have had sent me from Scotland under the name of *conflua*, either as regards size or colour. *N. baja.*—I bred some splendid varieties of this insect last season.

Tæniocampa rubricosa.—This varies from a very pale to a very dark form. *T. populeti.*—I met with a dark form of this insect. It is not an uncommon species in this district, its larva feeding between leaves of poplar.

Xanthia cerago.—I have bred this insect freely, and have a series in which the dark markings gradually disappear until they reach the variety *flavescens.*

Miselia oxyacanthæ.—The dark variety is of frequent occurrence.

From the foregoing list I have omitted some that vary, but not to the extent of those noticed.

Whittaker Lane, Little Eaton, near Derby:
April 19th, 1886.

DESCRIPTION OF THE LARVA OF *CRAMBUS PERLELLUS.*

BY G. T. PORRITT, F.L.S.

In July, 1884, Mr. Nelson M. Richardson sent me a supply of eggs of *Crambus perlellus*, obtained from a moth or moths he had taken in the neighbourhood of Llangennech, Carmarthenshire. They hatched in the third week of the same month, the newly emerged larvæ being yellowish-green, with a red longitudinal vessel or stripe showing through the skin, which gave them a salmon-coloured appearance; head and frontal plate dark brown, indeed almost black.

They were placed in a pot in which were growing one or more of the common garden lawn grasses, and on which they at once made themselves perfectly content.

On examining them on September 8th, I found they were living in silken galleries spun at the bottom of the grass stems, and were about one-third of an inch long. Four days later, on the 12th, I saw them again, when they were still only about the same length. The ground-colour varied from dingy olive-brown to dirty purplish-brown, the skin in all cases being so transparent that the internal alimentary vessel could be distinctly traced through it: the head varied from pale brown with darker marks to very dark sienna-brown; the frontal plate to some extent followed the colour of the head, but without the darker markings, and in the olive tinted specimens was paler and greener.

From this time they evidently hibernated, and I do not know at what date they recommenced feeding in the spring. By April 25th they were about three-eighths of an inch long, and of the usual *Crambus* form. Ground colour light mahogany-brown, the tubercles darker brown with a black dot in each; frontal plate almost unicolorous with the ground colour; head very dark sienna-brown throughout. They were living in galleries formed of particles of grass woven together with silk, and placed upright against the stems of grass, but resting on the ground at the base, their habit of living and feeding, indeed, being exactly like those of *Crambus Warringtonellus* as described by Buckler in the Ent. Mo. Mag. of November, 1880, p. 130. By June 1st they had reached half to five-eighths of an inch, and were still of the pale mahogany tint; the hind pair of tubercles on each segment had become much narrower than the front pair; the front pair were nearly round though slightly oblong, whereas the hind pair took almost the form of transverse streaks. At this time most of the larvæ appeared to be about moulting, and there was evident indication that with it would be a change of colour, for a greyish tint clearly showed through. By June 17th they were evidently full-grown, and were described as follows:—Length, three-quarters of an inch, stout, and of the usual *Crambus* shape, *i.e.*, cylindrical, of nearly uniform width, tapering slightly at the posterior segments; skin semi-transparent, the head, plates, and raised tubercles, polished; the front dorsal pair of tubercles on each segment, and those on the sides, round, the hind dorsal pairs narrow and almost oblong; segments well defined, and each having a sub-dividing transverse wrinkle in the middle.

The ground is of a greyish-stone colour, some specimens having a brownish tinge; head usually pale yellowish-brown slightly freckled with darker brown; but in occasional specimens it is much darker brown; in all cases the mandibles are dark sienna-brown; frontal plate of a slightly browner shade than the ground colour. The greenish alimentary canal shows through as the dorsal stripe; tubercles of a darker shade of the ground colour, each contains a black spot from which springs a single short hair; spiracles intensely black. Ventral surface of a paler shade than the dorsal area; anterior legs ringed and tipped, and the posterior legs slightly fringed with dark sienna-brown.

All through they fed and lived in precisely the same manner as does the larva of *C. Warringtonellus*. The first two imagos appeared on July 25th, and the others continued to appear until about the middle of August, by which time I had bred a nice series. Every specimen was of the pale-bronze veined form, and all were, as far as I could judge, exactly intermediate between the ordinary white form of *perlellus* and *Warringtonellus*; so much so, indeed, that I was puzzled to which species they belonged; and the more so, as on submitting some of them to Mr. Richardson, he was uncertain as to whether he had ever taken the white form on the ground where he had captured the parent of my specimens. On submitting some of them to Mr. Stainton, however, he referred them to *perlellus*.

From the foregoing description it will be found that the larva of *perlellus* agrees closely with that of *Warringtonellus*, and the rearing of it has not in any way shaken the opinion I have long held, that the latter is nothing more than a form of the former.

Huddersfield: *May* 12*th*, 1886.

TROPICAL AFRICAN *COLEOPTERA*; CHIEFLY FROM THE ZANZIBAR MAINLAND.

BY H. W. BATES, F.R.S., &c.

(*Continued from Vol.* xxii, *p.* 197).

CRASPEDOPHORUS DEFLEXUS, sp. n.—*Mediocriter convexus, niger, breviter setosus, palpis antennis tibiis et tarsis rufo-piceis, elytris utrinque maculis duabus rufis, interstitia* 5—8 *tegentibus,* 1*ma a basi sat distanti, quadrata: capite lato collo haud depresso, toto grosse punctato, oculis valde prominentibus: thorace latissimo, lateribus regulariter ab apice usque ad basin arcuatis sed versus apicem magis convergentibus, margine late explanato, nec reflexo, postice deflexo, angulis posticis denticulo acuto, toto grosse discrete punctato: elytris profunde punctato-striatis, interstitiis minus dense et grossius punctulatis.* *Long.* 17 *mm.*

Mount Cameroons; one example.

The form of the thorax is unlike that of any other species known to me. It approaches nearest *C. festivus* (Klug), but is much broader and less narrowed in front; the side margins are more broadly flattened even from the anterior angles, at first plane and behind deflexed, with a corresponding convexity of the dorsal surface towards the hind angles. The elytra are oblong-ovate, narrower at the base than the thorax at its widest part. The metathoracic episterna are scarcely broader than long, and the ventral segments are crenulated on their front margin. The apical joints of the palpi are not remarkably elongated at their exterior apex.

CRASPEDOPHORUS ABNORMIS, sp. n.—*Elongato-oblongus, mediocriter convexus, breviter setosus, niger, elytris utrinque maculis tribus flavis, prima humerali apud interstitium* 8*um*, *secunda antemediana interstitia* 4—6, *tertiaque sub-apicali interstitia* 4—8 *tegentibus: capite parvo, collo constricto, oculis valde prominentibus, sulcis frontalibus duobus profundis interspatioque valde convexo vertice sparsim punctato: thorace fere sicut in* C. brevicolli (*Dej.*), *sed lateribus antice latius rotundatis, transverso, lateribus arcuatis, angulis anticis late rotundatis, confertim grossissime punctato: elytris relative valde elongatis, oblongis, profunde punctato-striatis, stria* 3*ia apud maculam medianam flexuosa, interstitiis sat crebre punctatis.* *Long.* 21 *mm.*

Mpwapwa (*Mr. Last*); two examples, ♀?.

Unlike any other species, both in form and markings. Although the terminal joint of the palpi is simply obliquely triangular (♀?) it consorts better with the *Craspedophori*, in which that joint is greatly prolonged at its outer angle, than with the *Epicosmi*. The labrum has its front edge broadly emarginated: the antennæ are long, with the joints 4—9 much dilated and compressed. The metathoracic episterna are very long, and the ventral segments crenulated on their anterior margins. The anterior tarsi are simple. The median yellow spot of the elytra is sub-triangular, the inner portion of it (that which lies on the 3rd interstice) being longer than the two others; the sub-apical spot is flexuous and narrow.

Epigraphus insolitus, sp. n.—*Brevis et latus, niger, nitidus, dense brevissime setosus, palpis antennis pedibusque rufotestaceis elytrisque utrinque maculis duabus rufis,* 1*ma a basi sat distanti interstitia* 6—9 *vel* 5—8 *tegenti,* 2*nda versus apicem sub-rotundata interstitia* 4—8 *tegenti: capite sicut in* E. arcuaticolli *lato omnino punctato; thorace valde transverso, mox ab angulis anticis late rotundato, post medium lateribus sinuatis, angulis posticis valde prolongatis acutis, basi bisinuato, creberrime punctato; elytris punctato-striatis interstitiis creberrime punctulatis apice sinuatis. Long.* 12 *mm.*

Mount Cameroons; two examples, males.

This is the third species described of this remarkable genus, in which the males have four joints of the anterior tarsi moderately dilated, triangular or cordiform, and furnished on their soles with a brush of longish fine hairs; the sole example of such a structure in the section to which the *Panagæidæ* belong. In size the species resembles *E. amplicollis* (Schaum), of Natal, from which it differs *inter alia* in its pale reddish-testaceous legs and antennæ.

Sub-fam. *CHLÆNIINÆ.*

Chlænius mamboianus, sp. n.—C. signato, Boh. (apiato, Klug) *proxime affinis et simillimus: multo major, suprá toto fusco-cupreus, opacus, elytris macula parva discoidali* (*longe post medium*) *apiceque ipso, flavis; antennis valde elongatis et robustis nigris, articulo primo flavo, pedibus flavo-testaceis, genubus tibiis posticis intus tarsisque omnibus fuscis.*

Long. 14—17 *mm.*, ♂ ♀.

Mamboia (*Mr. Last*); many examples.

Belongs to the same group as *C. signatus* (Boh.), and similar to that species in general form and colours. But it is much larger and more robust, the antennæ especially longer and stouter, reaching to the middle of the elytra, and thickened after the third joint. The palpi are reddish-piceous, long and stout, the apical joint of the labials much broader and more truncated at the apex than in *C. signatus*. The colour above is dark coppery-brown, opaque, the margins of the head, thorax and elytra more or less brassy-green. The head and thorax are densely confluent-punctulate, as if minutely corroded, the elytra sharply punctulate-striate, with the interstices closely granulated. There is no trace of the yellow lateral vitta characteristic of *C. signatus*, but the small yellow spots on the posterior part of the disc are larger and united into a V-shaped spot, covering interstices 4—6, with a smaller detached spot on the 3rd; the apical (sutural) yellow spot is as in *C. signatus*.

CHLÆNIUS EURYSCOPUS, sp. n.—C. spoliato *affinis sed multo latior elytrisque maculatis. Brevior, glabratus, viridi-æneus elytris nigris, margine fascia mediana apiceque late flavo-testaceis; oculis valde prominentibus; thorace relative parvo breviter cordato, alutaceo vix punctato: elytris latis oblongis humeris late rotundatis, valde striatis, striis haud perspicue punctulatis, interstitiis impunctatis: corpore subtus nigro fere lævi, abdomine margine late pedibus palpis et antennis flavo-testaceis. Long.* 14 *mm.*, ♀.

Akele, Gaboon.

Belongs to the *spoliatus* sub-group of the genus; the thorax being nearly impunctate, as is also the prosternum, which shows only a few faint punctures in the middle of the episterna. The junction of the marginal with the basal fold of the elytra forms a distinct but obtuse angle, and the shoulders from the angle are very broadly rounded. The thorax is broader than long, with sides strongly rounded anteriorly, and equally strongly sinuate-angustate towards the base, straightening to form rectangular almost acute hind angles. The yellow border of the elytra extends to the 6th stria from the shoulder (where it is still further dilated) to the median fascia, which reaches the 2nd stria; between the fascia and the broad apical spot it reaches no further than the 8th stria. The disc of the head and thorax is of a rich purple-coppery hue.

CHLÆNIUS LASTII, sp. n.—*Species insolita, capite parvo collo crasso, palpis (labialibus) securiformibus elytrisque interstitiis* 3^{io} 5^{to} *et* 7^{mo} *angustis carinatis. Magnus, supra cæruleo-violaceus opacus, capite (postice) thoraceque grosse confluenter punctatis, elytris confertim subtiliter punctulatis; palpis labro (apice recto) antennis et pedibus pallide rufis. Long.* 25 *mm.*, ♀.

Mpwapwa, East Central Africa (*Mr. Last*).

This singular species approaches nearest *C. violaceipennis* (Chaud.), having a similarly formed, though smaller, head, and similarly securiform labial palpi; but instead of being nearly smooth like that species, it is above densely sculptured, most coarsely on the hind part of the head and the entire surface of the thorax. The latter is rather narrow and elongate, the sides only slightly rounded, scarcely narrowed behind, and little more so towards the front angles, which closely embrace the sides of the broad neck. The antennæ are slender, the 3rd joint nearly twice as long as the 4th. The 3rd, 5th and 7th elytral interstices are cariniform, with the summit of the ridges smooth or nearly so, all the rest of the surface is densely and finely punctured; the other interstices are moderately convex. The sides of the pro- and meta-sternum are strongly and rather closely punctured; the sides of the meso-sternum and abdomen less densely punctured.

CHLÆNIUS SWAHILIUS, sp. n.—*Valde elongatus, nigerrimus sub-nitidus, capite* (*media fronte excepta*) *thoraceque grossissime vix confluenter punctatis; elytris profunde punctulato-striatis interstitiis convexis sparsim punctatis: oculis vix prominentibus collo gradatim angustato; antennis valde elongatis, robustis; palpis apice late truncatis; thorace elongato antice sat late rotundato postice gradatim angustato, angulis obtusis, margine prope basin sat reflexo fovea utrinque basali elongato profundo.* *Long.* 28 *mm.*, ♀.

Mpwapwa, East Central Africa (*Mr. Last*).

In its structural characters this large and handsome *Chlænius* is intermediate between *C. violaceipennis* and *C. lugens*, but does not fit any of the sub-sections of Chaudoir's Monograph. The sides of the abdomen are irregularly and somewhat sparsely punctured, and there are a few fine punctures in the middle. The metathoracic episterna are not longer than broad, and are coarsely confluent-punctate, the sides of the pronotum being uniformly but remotely punctured. The thorax is relatively large, and its anterior part is as broad as the basal part of the elytra; the marginal fold of the latter forms an acute angle at the shoulders.

CHLÆNIUS MAKALOLO, sp. n.—*Elongatus, niger cæruleo-tinctus, capite* (*postice*) *thorace grossissime confluenter, elytrisque subtiliter punctatis: capite post oculos gradatim angustato; palpis apice haud dilatatis truncatis; labro antice recto: thorace sub-quadrato lateribus mediocriter et prope medium rotundatis angulis posticis sub-rectis: elytris profunde punctulato-striatis, interstitiis convexis alternatim sub-lævibus et crebre punctulatis.*

Long. 26 *mm.*, ♂ ♀.

Mozambique; Zambesi.

Closely allied to *C. swahilius* and belonging to the same group, but of different facies, owing to the form of the thorax—more quadrate, with sides only very slightly rounded at about the middle. The elytra are very much more finely and closely punctured and less shining, but the punctures are less numerous on the interstices 1, 3, 5 and 7 than on the alternate ones. The metathoracic episterna are quite as short as in *C. swahilius*, but less closely punctured.

CHLÆNIUS SCULPTILIS, sp. n.—C. carbonario (Dej.) *similis sed paullo longior, palpis minus dilatatis abdomineque medio sparsim punctulato-pubescenti. Elongato-oblongus, niger sub-opacus, capite postice thoraceque confertim* *sub-confluenter haud grosse punctatis: palpis labialibus ♂ mediocriter dilatatis truncatis; antennis validis, compressis; thorace elongato versus apicem parum versus basin haud angustato, lateribus vix rotundatis, intra marginem a basi usque ad apicem depressis vel sulcatis, foveaque utrinque elongata: elytris basi lato, angulo humerali acuto sub-dentato, profunde striatis vel sulcatis sulcis fundo crenato-punctatis, interstitiis omnibus convexis æqualiter haud subtiliter punctatis.* *Long.* 18 *mm.*, ♂.

Mamboia, East Central Africa (*Mr. Last*).

Similar in its elongate-oblong parallel-sided form and uniform black colour to *C. carbonarius*; also not unlike the species of the South African group to which *C. piceus*, &c., belong: but differs from all in the very evident though sparse punctuation of the middle part of the abdomen, which character would place the species in a different division, according to Chaudoir's classification. The sides of the pronotum, the metathoracic episterna and sides of the abdomen are covered with large but well separated punctures.

(*To be continued.*)

Heydenia auromaculata in Shetland, a species new to Britain.—When looking over Dr. Mason's collection at Burton-on-Trent, he showed me some specimens of a small moth which he had received under the name of *Œcophora flavimaculella*, but which he thought distinct. Being decidedly of the same opinion, I took an early opportunity of comparing it with Continental species in Mr. Stainton's collection, when it became at once evident that it was *Heydenia auromaculata*, Frey, a species hitherto only known to occur in the Alps, southern and eastern Switzerland, and in Norway.

Dr. Mason's specimens were taken in Shetland by (I believe) Mr. McArthur, and I understand that specimens have been distributed into other collections under the name of *Œcophora flavimaculella*, to which this novelty is nearly allied—both being placed by Hofmann in the genus *Heydenia*, with other seed-feeders This is a pretty species, larger than *flavimaculella*, and having, in addition to the two yellow spots on the fore-wings as in that species, three more, one at the base and the other two above that which is on the inner margin, so that the three form a twice divided fascia across the wing. The outer spot nearer the apex is also much larger than in *flavimaculella*. Its larva in all probability feeds in the seeds of some umbelliferous plant, like its allies, but does not seem to be known.—Chas. G. Barrett, 68, Camberwell Grove, S.E.: *May* 14*th*, 1886.

Note on Antispila Pfeifferella.—During a short stay at Freshwater, Isle of Wight, in July last, I found the larva of this species in the greatest profusion in one of the many old fashioned lanes, with hedges six or eight feet high, that lead from Farringford to Totland Bay. There were only two good sized bushes of *Cornus sanguinea*, but nearly every leaf was mined by one or two larvæ; wanting the species badly myself as also for my friends, I collected a good supply; also, I had long wished to verify a statement by Mr. C. Healy, in the Entomologist, vol. ii, p. 129, and again mentioned in the Nat. Hist. Tineina, vol. xi, p. 310, which has always seemed rather puzzling to me, viz.: that the larvæ when full fed cut out their oval cases, descend to the ground, and convey their cases under the surface of the earth, and there change to the pupa state. This habit in a larva which is apodal appeared to me most extraordinary, and to test it I placed all the leaves I had in several glass jars with open tops like ordinary tumblers, with some fine earth at the bottom taken from the hedge where I obtained the larvæ, I then buried all the jars half down in a box of earth so that no light should get to the sides and left them for three months. I then very carefully examined the sides of the glass jars, but could not detect a single case below the surface of the earth. I then carefully took out the layers of leaves in all the jars, and found the cases were all concealed between the decaying leaves in exactly the same way as with its congener *Treitschkiella*. In some instances there were as many as twenty cases all close together in one patch. After carefully taking all the leaves out of each jar, I found numbers of cases on the surface of the earth, I then removed all these cases from the surface, and turned the earth out of each jar on to a sheet of paper, but with all my careful searching I did not find in any of the jars a single case that was beneath the surface, so that I am quite convinced there must have been some error in Mr. Healy's observations, or that the jam-pots which he generally used must have been shaken by some one unknown to him, so that the cases became mixed with the earth. He also says the species is very difficult to breed, which, again, is different to my experience, for by forcing in a temperature between 60° and 70° I have, during last month and the early part of this, had them emerging most freely.—Geo. Elisha, 122, Shepherdess Walk, City Road, N.: *April* 19*th*, 1886.

Cosmopteryx Scribaïella bred freely at Stettin.—We have now at Stettin all the known European species of the genus *Cosmopteryx*, since in the autumn of 1885 we found there the larvæ of *Scribaïella*, and in far greater plenty than those of *Lienigiella*, for in spite of the most careful search we found scarcely more than 30 of the last named species, whereas of *Scribaïella* we collected *several hundred* larvæ. These we found in individual plants of reed (*Arundo phragmites*), which grew in sheltered situations under young fir-trees (*Pinus sylvestris*) at the edge of a nearly dry ditch in a sandy locality; on some plants there were as many as 50 mines! The larva winters head downwards in the lowermost part of the mine, which here tapers to merely the breadth of the larva; this slender portion of the mine is from 15 to 20 mm. long, but sometimes has even a length of 60 to 80 mm. A mine of *Lienigiella* which I found at the same time was perceptibly broader, but shorter than those of *Scribaïella*. Besides, the larva of *Lienigiella* does not pass the winter at the narrow lower end of its mine, but nearer the middle of the mine, where it has a breadth of more than 10 mm. One can besides readily distinguish the two larvæ, if we compare them whilst they are feeding in fresh green leaves of the reed. The figure of the larva of *Lienigiella*, given in Stainton's "Natural History of the Tineina," vol. xii, Pl. i, fig. 1, is a very good representation of that larva. The larva of *Scribaïella* has an average length of 3½ mm., and is smaller than the larva of *Lienigiella;* it is *greenish-white*, without markings, only the dorsal vessel is pale brown; the head is rather darker, but yet of a pale brown, with only the margins darker. The mark on the second segment is similar to that shown in the figure of the larva of *Lienigiella*, only not quite so dark. The anal segment bears a yellow-brown plate, but in many of the larvæ which I examined this segment only bore the same colour as the rest of the body, nor could I perceive any distinction when examining it with a lens. I bred my first specimen in an unwarmed room, on the 5th of April, and they still continue to come out daily.

As I am anxious to obtain correspondents among the more eager Micro-Lepidopterists in your country, I may mention, that I have surplus specimens of *Cosmopteryx Scribaïella*, *Ornix petiolella*, *Laverna vanella*, *Stagmatophora Heydeniella* and *albiapicella*, *Lithocolletis Staintoniella*, and sundry others of that genus, *Elachista pomerana*, *Agdistis tamaricis*, and many others. On the other hand I should be very thankful for specimens of *Agdistis Bennetii*, *Oxyptilus teucrii*, *Goniodoma limoniella*, *Elachista kilmunella*, and other special English species.—E. Hering, Hauptmann, Rastatt, in Baden, Germany: *April 22nd*, 1886.

[The occurrence of *Cosmopteryx Scribaïella* so far North as Stettin (and even in plenty there) is of special interest. The insect was first detected at Vienna, and has since occurred at Bremgarten, in Switzerland, where the larva was discovered in the leaves of *Arundo phragmites*, on the banks of the Reuss. Very probably it will yet be found in some of the Southern counties of England.—H. T. S.].

Trifurcula pallidella and Genista tinctoria.—I took my specimen of *T. pallidella* (*cf.* Ent. Mo. Mag., vol. xvi, p. 186) among *Genista tinctoria*, of which there was only a very little in a small plantation which, thanks (for once) to game-preserving, is not likely to be ploughed up. The plant grows sparingly in the next field, which has a north aspect and few insects occur there.

Pallidella seems to be on the alert from 7 to 9 a.m.; perhaps we have a knack of missing many species which fly at that time of day. *Œcophora grandis* I know likes the morning sun.—J. B. Hodgkinson, 6, Fishergate Hill, Preston: *March 31st*, 1886.

On the synonymy of some species of Nyctemera.—*Nyctemera annulata*, Boisd., Dbld. (*nec* Walk.); *N. Doubledayi*, Walk. This species has been generally confused with the following, from which it is easily and at once separated by the wholly black cilia; there are other minor differences, and the larvæ of the two species are also quite dissimilar; this species is liable to have the white markings greatly reduced or even wholly absent, which is never the case in the following. Boisduval's figure is admirable and unmistakeable, the only fault being that the yellow lines of the thorax (which was perhaps defaced) are not represented, but no similar species with a wholly black thorax is known to me. Boisduval's type was from New Guinea; I have only seen the species from New Zealand, where it is generally abundant.

Nyctemera amica, White; *N. annulata*, Walk. White's name must now be adopted for this species, in which the terminal half of the cilia is sharply yellowish-white; it is confined, so far as I know, to Southern and Eastern Australia.

Nyctemera tertiana, sp. n. I propose this name for the species described and figured by Snellen (Tijd. v. Ent., 1878, 72, pl. vi, 6) as *N. latistriga*, Walk., which it is not; believing it to be sufficiently distinct from *N. lacticinia*, Cr. The species occurs in North-East Australia and Celebes; it varies in having the inner margin of the hind-wings sometimes very broadly suffused with blackish, so that the white colour is reduced to a discal spot; this is certainly a variety only.—E. Meyrick, The King's School, Parramatta, N.S.W.: *April 3rd*, 1886.

On two species of Histeridæ at present not included in our British List.—*Gnathoncus punctulatus*, Thoms. Among some *Coleoptera* supposed to have been taken by the Rev. A. Matthews, some years ago, in Oxfordshire, I found three specimens, which have been forwarded by Mr. Lewis to Herr J. Schmidt of Gollwitz, and have been returned by him as being (as far as regards two of them) *Gnathoncus* (*Saprinus*) *punctulatus* of Thomson, without any doubt or comment. It will be remembered (as Dr. Sharp has pointed out to me) that this species was recorded as British by Mr. Crotch (Trans. Ent. Soc. Lond., 1867, p. 445; Ent. Ann., 1867, p. 70), but that Mr. Rye subsequently saw reason for doubting its specific difference from *G. rotundata*. Certainly upon the two specimens taken by Mr. Matthews the idea of their being identical with *G. rotundata* did not even occur to me.

The third specimen Herr Schmidt returns as *Saprinus præcox*, Er., but remarks "this cannot be of Britain." This specimen is superficially very like the *Gnathoncus*, the most evident distinction being the generic one, viz., that in *Gnathoncus* the prosternum in front has its marginal striæ suddenly converging, thus being lanceolate, while in *Saprinus* the same lines gradually meet, so that the ridge of the prosternum is pointed. This insect appears, from the Munich Catalogue, to inhabit Egypt, and its occurrence here will certainly require corroboration. *Gnathonci* inhabit pigeons' and other birds' nests, and places such as towers where owls breed, and it would be worth while, if any one has the opportunity of visiting such places, to bear in mind the probability of our having more than one species of *Histeridæ* co-existing with the birds.—Henry S. Gorham, Shirley Warren: *May 18th*, 1886.

Diglossa mersa at Ventnor.—On April 24th, I found *Diglossa mersa* in numbers on the shore at Ventnor; the morning was very warm, and the beetles were flying in the hot sun and settling on the rocks and shingle; as they ran they fell into the small pools on and among the rocks and so were trapped.—W. W. Fowler, Lincoln: *May 12th*, 1886.

Homalium rugulipenne, Rye, at Wallasey.—I spent the afternoon of March 24th on the Wallasey sand-hills, where I found the spring beetles, *Aphodii* especially (and *A. inquinatus*, *scybalarius*, and *punctatosulcatus* more particularly), very abundant. On the shore, beneath a dead gull, I had the good fortune to meet with *Homalium rugulipenne* in some numbers, but the wind was blowing so strongly at the time that I found the capture of them a thing of difficulty.—John W. Ellis, 3, Brougham Terrace, Liverpool: *April 13th*, 1886.

Acritus punctum, Aubé.—This pretty minute *Hister* has been a rarity in our collections ever since Dr. Sharp and the late Mr. Crotch first found it on the famous Chesil Bank, more than twenty years ago; and many a handful of tidal refuse have I shaken over paper, in the precise locality of its original capture (kindly indicated to me by Dr. Sharp), in the vain hope of obtaining it. On the afternoon of April

22nd I happened to be at Hayling Island, and as I was returning along the beach to the ferry, I caught sight of a glistening black atom in a small hole in the sand, which I at once saw was the long-sought *Acritus punctum.* By carefully examining my own footprints in the sand made some two hours previously, I was rewarded by a good series of the little creature. Acting on the experience thus gained, I tried digging small holes as traps in the sand just above high water mark in the old locality, on the Chesil Beach, and found the beetle in them not rarely on warm sunny afternoons. It probably lives in the tidal refuse (which is here so mixed with sand as to render its examination very difficult), and comes out to fly in the hot sunshine.

I may add that my friend, Mr. Moncreaff, has since taken *Acritus punctum* at Hayling Island, and has also found a specimen among his duplicates which he took there in 1871.—JAMES J. WALKER, H.M.S. Cherub, Portland: *May* 11*th*, 1886.

Pentarthrum Huttoni, Woll., at Portland.—I took two specimens of the very local wood-feeding weevil, *Pentarthrum Huttoni,* on May 1st, crawling on a stone wall in one of the villages in the Isle of Portland; a most unexpected capture in this almost treeless locality.—ID.

Note on the case, &c., of Oxyethira costalis, Curt.—Mr. Bolton, of Birmingham, in his endeavours to supply his subscribers with "living objects for the microscope," has done good service in elucidating the life-histories of various minute *Trichoptera,* especially *Hydroptilidæ,* the cases and larvæ of which he finds in his aquaria. My friend Mr. Morton, of Carluke, has already detailed the habits of *Agraylea multipunctata* (*cf.* vol. xxii, p. 269) from materials supplied by Mr. Bolton. Another problem has been solved. Mr. Bolton has, on more than one occasion, forwarded to me a larva in a singularly-transparent flat case of a *broad wedge-shape,* which, when the larva is about to change to the pupal condition, is attached by its anterior angles much in the same way as described for the four angles of the case of *Agraylea.* This larva has produced *Oxyethira costalis,* the early conditions of which were unknown. I hope Mr. Morton will hereafter be able to give a detailed account from materials sent to him, and, therefore, regard this note as only preliminary. The transparency of the *larval* case is so great that a micro-photograph received from Mr. Bolton fails to define the outline at the broad end of the wedge.—R. MCLACHLAN, Lewisham: *May,* 1886.

Tinodes dives, Pict., in Cumberland.—Among some *Trichoptera* taken by my friend the Rev. A. E. Eaton, in Cumberland, in 1885, I find 2 ♂ and 1 ♀ of *T. dives* from Cross Fell and Ousby in June. As British it was, I think, known only from Derbyshire, where the late Mr. Edwin Brown found it in 1868 (*cf.* Ent. Mo. Mag., v, p. 277, recorded as *T. Schmidtii,* Kolenati), and where I found it in August, 1869. On the continent it is a widely-distributed sub-alpine insect, frequenting weedy streams with comparatively warm water. The species of the genus *Tinodes* have unicolorous wings; but, as an exception, *T. dives* has a large spot of golden pubescence on its black anterior wings, seldom visible in captured specimens owing to rubbing, and from this latter cause it rejoices in a quantity of synonyms; it also rejoices in the possession of ♂ appendices of so peculiar a form as to render the condition of the pubescence of no consequence so far as regards specific identification. —ID.: *March* 31*st,* 1886.

Ants and Coccidæ.—The *Lecania*, this year much less numerous than usual on the trees they affect, have been about ten days late in their nuptial preparations, but the few bright, hot days last week stimulated their dormant energies, and both sexes have thrown off their brown winter covering. The males now appear in a grey or grey-white suit; some have pushed out of it the pupa skin; some have even got a stage further, and have extruded the long silvery tails, and in a few days more the perfect bridegroom will come forth in full array, his late covering being then clear white. The female, having the care of a family before her, has appropriately a sober garb of variegated brown and yellow, which will soon become of a uniform brown hue; this will serve for her dwelling as long as she lives, and also for a nest for her eggs and young ones, and she will die there. In this community the gentlemen, and not the ladies, on bridal occasions are dressed in white. Just now these females are the object of special attention by ants (*Formica nigra*); sometimes three or four diligently watch and wait on one *Lecanium*, no doubt for some tributory exudation which is grateful to them. I do not remember hearing of this phase of their character, though their devotion to *Aphides* for a consideration is well known.—J. W. Douglas, 8, Beaufort Gardens, Lewisham: *May* 10*th*, 1886.

Review.

The Larvæ of the British Butterflies and Moths; by the late Wm. Buckler. Vol. I: The Butterflies. Ray Society, 1886: 8vo, pp. 202, with 17 coloured plates.

Probably most British Lepidopterists have looked forward to the appearance of this volume as much as I myself have done, and certainly none will be disappointed with it, now that it is before them; the great storehouse of facts given in this book will enable us all to gain a much larger knowledge of our native butterflies than was before possible, and it is well here to pause and feel the power of united work, how many heads and hands have joined together to make this volume what it is; none the less honour on this account to the memory of the man who worked out and noted the results so carefully; how many hours of patient labour must he have given, not only to the figures, but to the invaluable remarks on the life-histories of the larvæ; how thankful, also, must all be that Mr. Buckler found so true a coadjutator as Mr. Hellins, who has been enabled so ably to supplement the labours of his late friend and fellow-worker. Thanks to the Ray Society, there is in the volume before me the commencement of a series that promises to add more to the knowledge of our native *Lepidoptera* than any work we have seen for many years.

"Much would have more," is an old saying; here it is used by me in a double sense—first, it implies an increased longing for the next volume; and, secondly, it means that our native entomologists must be stimulated to supply the gaps in the work before them, and though very few indeed can have either the pencil or the power of accurate observation given to our late friend Mr. Buckler, yet all may help to the utmost of their ability. Would that he had been left amongst us long enough to perfect the work himself.

After this preface, let me now briefly indicate what this volume tells us, and somewhat also of what it leaves untold. Most readers will, it is probable, turn to the plates first, and where all are good it is difficult to distinguish any specially, yet the following amongst the larvæ known to me seem peculiarly natural and life-like: the figures of *Aporia cratægi* reproduce the larva in all its stages exactly; that of our common *Pieris brassicæ* is exquisite, and few larvæ are more difficult to paint than this; both *Lasiommata Megæra* and *Egeria* admirable, so is fig. 3*a* of *Hipparchia Hyperanthus*; *Vanessa Io* and *V. polychloros* seem to be perfect, and the drawings 3*a* and 3*b* of *Vanessa comma* are very good; I would again mention *Argynnis Paphia* and *A. Aglaia*, so also *Thecla quercûs*, and fig. 4*a* of *Lycæna Phlæas*; of *Polyommatus Argiolus*, figs. 1 and 1*a* are excellent, so also are the caterpillars of *P. Alexis*. The larva of *Apatura Iris* is unknown to me, but the colouring and drawing of its varied positions are most artistic; the resemblance to a sea-slug is so great, that it would be mimetic, could any possible protection spring from the likeness. The pupæ, on the whole, are certainly more sketchy, and less detailed than the larvæ, but some, as for example, *Aporia cratægi*, *Lasiommata Egeria*, *Melitæa Artemis*, and *M. Athalia*, are very faithful to nature.

There are no figures of *Colias Hyale*, *Argynnis Lathonia*, *Lycæna Arion*, *L. Acis*, and *Pamphila comma*. It must be remembered that it was only of late years that Mr. Buckler tried to procure larvæ from the continent; it probably would not be difficult to obtain three out of these five desiderata, but, alas! where would be the pencil of our author? *Erebia Cassiope* is only figured in its early stages, and some others are only drawn in their last moult; this list shows how little there is left to be done to make the work perfect.

The volume does not, however, owe its importance only to the plates; the life-histories of the larvæ are always most interesting, and, in some cases, wonderfully complete. How admirable in its details and in its exactness is the account of *Papilio Machaon*; the story of the larva from its ceasing to feed to the completion of its change (pp. 3—5) is almost microscopic in its fidelity; of course the history is "really," as he says, "the personal history of the individuals which he watched;" and it makes me long to know how the same beings would comport themselves in the wild state, what purpose in their economy is fulfilled by those wonderful retractile horns, with their secretion smelling "like an overkept decaying pineapple;" perhaps they are protective, though, judging from numerous pupæ, British *Machaon* seem quite free from parasites,* yet perhaps the pungent smell may render the larva distasteful to birds, and prevent its becoming a palatable breakfast for the sedge-bird or the bearded titmouse, perhaps even the young widgeon or the teal. These horns have no parallel in the telescopic tails of the young puss larva, perhaps their true homologue may be rather found in the processes projecting from the penultimate segment of some, at least of the larvæ of *Polyommatus*, but these last seem attractive rather than protective. The pupa of *Machaon* is only described in its one colouring of green and yellow; there is both in England, and on the continent another very differently coloured pupa (wood-brown), beautifully marbled with darker bands—from these I have reared the perfect insect frequently.

Gonepteryx rhamni.—No account of this larva from Mr. Buckler, but an admirable summary of its life in the appendix by Mr. Hellins; though *Rhamnus*

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* From continental pupæ I have reared a large black ichneumon (named by Mr. Fitch *Trogus lapidator*), and also, to my grief, a very similar species, only with a steel-blue gloss, from the pupæ of *Papilio Hospiton.*

frangula is the favourite food, I can, from my own experience, corroborate Mr. Stainton's note, that *R. catharticus* is sometimes chosen. It is worth our while to contrast the life of *G. rhamni*, ten months in the perfect state, with that of *Polyommatus Alsus*, ten months in the state of larva.

Colias Edusa.—The fact of this insect being double brooded is proved conclusively, and the account of the larva is very complete.*

C. Hyale.—An interesting history until the period of hibernation, but incomplete.

Of *Aporia cratægi* there is no account, but the figures only; *Pieris brassicæ*, *rapæ*, and *napi* are supplemented in a most interesting manner by Mr. Hellins. I can add mignonette as a favourite food of *P. rapæ*, also *Alliaria officinalis* and *Cardamine pratensis* to the food plants of *Pieris napi*. The history of *Pieris Daplidice* is very full and most interesting, and the deduction (from the larvæ dying of cold as early as the 28th of September) "that *Daplidice* is quite unsuited to our climate, and is an insect belonging to a warmer country," is probably quite correct.†

Anthocharis cardamines is only described by Mr. Hellins in the last moult. My first acquaintance with this larva was at Lewisham, when it was pointed out to me by Mr. Stainton on the flower stems of horse-radish in his garden. Many of the *Cruciferæ* are mentioned as its food-plants (*Sinapis arvensis*, *Turritis glabra*, and others); I should have been inclined to look on *Cardamine pratensis* as its favourite, but though this is in the list, Mr. Harwood looks on *S. arvensis* as first.

The description of *Leucophasia sinapis* is brief, but very good, that of the strange pupa excellent; I have watched the female depositing eggs upon *Lotus corniculatus*.

The larvæ of the various *Satyridæ* are so retired in their habits, and hide so deftly amongst the grass to which they for the most part much assimilate in colour, that they are not often met with, except by those who specially search for them; the life-history of most, when supplemented by Mr. Hellins' notes, is highly interesting, *Erebia Cassiope* (*Epiphron*) being the only one left quite incomplete, the larvæ of this insect dying during hibernation, and therefore before attaining the full growth.

With regard to *Lasiommata Egeria* and *Megæra*, one of my puzzles, is yet left undetermined. By the dates of Mr. Hellins, *L. Egeria* is found in Devon in April and May.‡ My dates are April 9th, 1843, Teignmouth, common; April 12th, Lympstone; again in June and July; and finally my latest date is September 25th, 1865, Teignmouth: in September, 1873, it is noted as common at Heidelberg. Are the April and June broods the same flight, or do the April insects pass the winter in the pupa state? I can fully confirm the fact that the eggs of the autumn brood develop larvæ which hibernate as such; but with regard to *Megæra*, I found in November, 1879, at Teignmouth, a full-fed larva which suspended itself, and became a pupa at once. It was unfortunately ichneumoned; but an egg laid in August produced a larva which, in a warm room, fed up, became a pupa, and emerged November 15th. This proves nothing, as artificial heat was employed, but the full-grown caterpillar was at large. The earliest appearance of *Megæra* noted by me is May 2nd.

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* The idea of the older entomologists was that the female lived through the winter and deposited her eggs in the spring. The dates here given militate against this eggs laid by a female October 10th (Mr. Barrett, Pembroke), and June 12th (Rev. E. T. Daubeny, Bedhampton). I have myself seen a female depositing eggs late in October at Lympstone, Devon, and another on June 27th in the Rhone Valley. In both cases the eggs were laid on leaves of clover.

† Mr. Barrett gave the same reason for the larvæ of *Deiopeia pulchella* not arriving at perfection; the coldness of our autumn months preventing the larvæ from feeding up fully is very likely a powerful factor in preventing these insects from gaining a more permanent footing in our island.

‡ My old theory of these broods was that the larvæ from the April or May butterflies produced the autumn brood of August and September: that the eggs from these came to larvæ which fed through the winter and came to perfection in June, and that larvæ from these completed the cycle and appeared in April and May, passing the winter as pupæ. This is disproved by Mr. Hellins' careful notes; but I imagine that in mild winters larvæ may feed instead of hibernating, and pupate early, or in some exceptional cases, change late in the autumn.

Of *S. Hyperanthus* I have the following notes: "Eggs laid freely by a female on July 16th, larvæ lived through the winter, became full fed in the following June, did not suspend themselves, but changed into pupæ on the surface of the earth and emerged in July." The notes and figures of *S. Semele* are most interesting, both larva and pupa are unknown to me, but they bring a piece of entomological gossip of by-gone days back to my mind. In my student years the finding of a larva of *S. Briseis* near Stoke Newington was only a few years old, and had not passed out of memory, and Mr. Edward Doubleday (to whose den under the British Museum I was a frequent visitor, and whose kindly help on many entomological points I still gratefully remember), once said to me, "I asked the gentleman who found it if it hung itself up by the tail, and when he answered, no, it buried, I then felt sure that there was no mistake."

The history of *Apatura Iris*, and of the whole genus *Argynnis* amongst the *Nymphalidæ*, is wonderful in its minuteness of detail, and were I not sure that every Lepidopterist would get the book, I should quote the history of the full-grown *Argynnis Euphrosyne* larva as specially interesting. This may be said, however, from my experience of *Argynnis Aglaia*, that the larva does not always conceal itself before pupating, as I have found both the suspended larva and pupa at Lynmouth on the bare limestone rock. *Argynnis Lathonia* and *Melitæa Cinxia* are without any description, though the adult larva of the latter is well figured. With regard to *M. Athalia*, *Melampyrum pratense* and *M. sylvaticum* are the only food-plants given: unless my memory fails me, Mr. Reading of Plymouth found the larva feeding on the common wood sage, *Teucrium scorodonia*. I once found a brood of *M. didyma* larvæ in the Saas Valley, feeding on *Teucrium montanum*, and succeeded in rearing some of them. It will be borne in mind that *Melampyrum* is scrophulariaceous, while *Teucrium* is labiate.

The life of our only European *Erycina*, *Nemeobius Lucina*, is well worked out,* and the *Lycænidæ* are admirable. Neither history nor figure of *Lycæna Acis* is given, and there is no figure of *Lycæna Arion*, but its early history, which is all that is known, is worked out as far as the time of hibernation. There are figures but no written history of *Thecla pruni* and *Th. w-album*. With regard to *Lycæna*

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* In Mr. Edwards' work on "The Butterflies of North America" it is interesting to note how nearly in its larva and mode of pupation, as well as in the imago state, the genus *Lemonias* approaches our *Nemeobius*; and it may be worth a passing remark, how often insects of the same genus resemble each other, as indeed is natural, in the antecedent stages. Thus not only is the larva of the closely allied *Papilio Zolicaon* almost identical with that of *P. Machaon*, but the larva of so different a species as *P. brevicauda* is very similar, not only in the adult stage, but even in the white saddle-like marking of the young larvæ, and this seems also to be the case with *P. Turnus* and its allies, *Daunus* and *Rutilus*, though the adult larva is much less striped. *P. Ajax* seems rather to resemble *Podalirius*; so the larva of the widely different *Apatura celtis* is very like that of *A. Iris*; and even the larvæ of the very distinct *Disippus* group of *Limenitis* are exactly similar in form, though not in colour, to those of *L. Sibylla*. Many other examples might be quoted, but the North American *Graptæ* and our own *Acronyctæ* prove that the rule is not universal.

Argiolus, I have two figures taken by myself from larvæ found in October on ivy, which exactly resemble the figures 1 and 1*a* of plate 14, and which were drawn from the larvæ found in summer on the holly. It is not always the habit of *Lycæna Ægon* to pupate on the surface of the earth, for I have often reared it from pupæ found at Zermatt attached to large stones, in the usual manner of *Lycænæ*, viz., by a button at the tail and a girdle around the middle; the full-fed larva was also frequent, and there they probably ate some species of *Astragalus* or *Oxytropis*. The life-history of *L. Medon* given in the book is very full and most important, as it establishes conclusively the identity of *L. Medon* and the form *Artaxerxes*. Is *L. Medon* ever double brooded in England? When speaking of the horns of *Papilio Machaon*, mention was made of processes which existed in some of the larvæ of the *Lycænæ*; they are not mentioned in this book, but the opportunity given by this paper is taken to direct the attention of British entomologists to their existence. Dr. Hagen's account of them seems the clearest. Speaking of *L. Argus* and *L. Corydon*, he says: "You find on the penultimate segment outside and behind the stigmata two large white spots, each one of which evaginates a white membranous tube, just like the finger of a glove, the top of which is not entirely drawn out." "On the ante-penultimate segment is a large and transverse opening behind and between the stigmata near the apical border. It looks like a closed mouth with its lips, but I have not seen anything protruding from it; but in an alcoholic larva of *Argus* I saw an ovoid evagination."

These processes were first, I believe, discovered by Guenée, and the fact that ants haunted the larvæ and followed them for the sake of the secretion was first remarked by Prof. Zeller. This ant companionship is detailed in a very interesting manner by Mr. Edwards in his "Butterflies of North America," under the head of *Lycæna pseudargiolus*, from which much of the above account is quoted.*

From the *Lycænidæ* we pass to the skippers, to me almost the most interesting part of the book, since I have never seen as yet one larva of any of the group. Fortified by the clues here given, I shall now hope to find them, and learn somewhat of their economy from personal experience. *Pamphila comma* is without figure or description, and the only fact that is recorded about it is, that it hibernates in the egg state.

The reason that in this notice attention has most pointedly been called to omissions, is in the hopes that even yet the eggs or larvæ of some of the species may be sent to Mr. Hellins, so that when the work is completed, some more supplementary notes, such, for example, as are here given in the account of *H. Tithonus*, may yet be in store for us.

In summing up the importance of this volume, one great fact must be borne in mind, that the student can now get the figures and descriptions of almost all our native butterflies from the fresh and accurate observations of one man, not by reference to the descriptions of various authors in various works difficult to procure, or accounts scattered through different magazines, but in one volume of entirely original work. It was the duty of entomologists to subscribe to the Ray Society before,* it becomes doubly so by the publication of this volume.

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* Mr. Edwards concludes, from his own observations, that the return which the ants give for the liquor that they love is to protect the larvæ from ichneumons, and he relates how he saw them so ward off the attack of an *Anomalon*. We knew that they kept cows in the *Aphides*, but here we find them taking care of milch elephants; verily, "the ants are little upon the earth, but they are exceeding wise."

Perhaps some apology is needed for the length of this notice, considering that many of the most interesting parts of the book have been before published in the pages of this Magazine, but the great importance of the work, and the amount of collected original information which it contains, must be my excuse. It will prove for many years *the* text book on the larvæ of British butterflies.—R. C. R. JORDAN, Edgbaston: *March*, 1886.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY, *April* 15*th*, 1886: R. ADKIN, Esq., F.E.S., President, in the Chair.

Messrs. T. D. A. Cockerell, A. J. Windybank, T. P. Newman, W. H. Wright, T. Gibbs, Jun., and W. F. de V. Kane, were elected Members.

Mr. Mera exhibited a fine series of *Syntomis Phegea*, Linn., bred from ova deposited by a female taken in Italy. Mr. E. Joy, a variety of *Cœnonympha Pamphilus*, L., taken at Hadley Wood, near Barnet. Mr. Tugwell, a bred series of the Dover form of *Cidaria suffumata*, Hb. Mr. Wellman, specimens of *Phoxopteryx upupana*, Tr. Mr. Billups exhibited a curious construction, which had been found by Mr. J. T. Williams under a stone in his garden at Foots Cray; the formation consisted of about fifteen or sixteen fusiform cocoons, composed of a felt-like material and arranged side by side, vertically and transversely, the whole forming a pear-shaped mass; each cocoon contained a larva which Mr. Billups said was certainly not Dipterous nor Hymenopterous, but might probably be the larva of a species of *Lepidoptera*. Several Members concurred in this opinion.

May 6*th*, 1886: The President in the Chair.

Messrs. F. Enock and C. Brady were elected Members.

Mr. Elisha exhibited a bred series of *Antispila Pfeifferella*, Hb., Stn., with specimens of the mined leaves, and the pupa cases cut out from the leaves. Mr. Wellman, *Cidaria suffumata*, Hb., including the Dover form; a fine series of *Clostera reclusa*, Fb.; also *Adela cuprella*, Thnb., Fb., Stn. Mr. West, a fine series of *Ephyra punctaria*, L. Mr. Mera, *Aleucis pictaria*, Curt. The President showed a long series of *Endromis versicolor*, L, and stated in reference to his exhibit, that in March, 1884, he received twenty-five ova from Mr. Gibb, the parent moth having been inbred, originally from Rannoch specimens; in due course the larvæ fed up, the first moth (a male) emerging on the 19th April, 1885, and was followed by eight others, all females, and this year he had bred twelve males. He thought it was a fact worthy of notice, that the first year he should breed all females, and the next all males. Of course his observation only extended to a portion of the brood, and it would be interesting to know whether or not the remainder of the brood had emerged in the same manner. Mr. Carrington communicated notes of a visit at Easter to Selborne, the home of Gilbert White. In the report of the Meeting on

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* To show what entomology owes to this Society, I may give the following list of works since 1865:—Hemiptera-Heteroptera, Douglas and Scott, 1865; British Aphides, Buckton, 1875, 1877, 1880, 1882; Colembola and Thysanura, Lubbock, 1873; British Phytophagous Hymenoptera, Cameron, 1882, 1884; not including the volume on *Oribatidæ* published in 1883.

February 18th, it should have been stated that *Meligethes exilis* and *Anthicus Schaumi* were only received from Lincoln, not taken there.—H. W. Barker and W. A. Pearce, *Hon. Secs.*

Entomological Society of London, *May 5th*, 1886: Prof. J. O. Westwood, M.A., F.L.S., Hon. Life-President, in the Chair.

Mr. William Saunders, the President of the Entomological Society of Ontario, was present as a visitor.

The following were elected Fellows of the Society, viz.:—The Rev. E. N. Bloomfield, M.A., Mr. Frederick Fitch (formerly Subscribers), Mr. A. J. Rose of Stoke Newington, and Mr. William E. Nicholson of Lewes.

Mr. Jenner Weir exhibited a large and spiny Lepidopterous larva which he had received some years ago from the late Mr. Andrew Swanzy, who obtained it in Western Africa.

Mr. Stevens exhibited a number of *Coleoptera* recently obtained in the Isle of Wight, including *Apion sorbi.*

Mr. Crowley exhibited four specimens of *Leto Venus*, a large and handsome moth belonging to the family *Hepialidæ*, from Natal.

Mr. Howard Vaughan exhibited a long series of *Cidaria immanata* from Kent, Surrey, and other southern counties, Perthshire, Isle of Man, Isle of Arran, the Orkneys, and Shetlands. He also exhibited *C. russata* from various localities in the South of England, and from Perthshire, Argyllshire, and the Islands of Arran, Lewis, and Hoy. Mr. Vaughan further exhibited varieties of *C. suffumata* from Dover and Darlington.

Prof. Westwood commented on the interesting nature of the exhibition of *C. immanata*, and stated that he had never before seen such a wonderful collection of varieties of a single species.

Mr. McLachlan exhibited, for Mr. G. Lewis, living specimens of *Paussus Favieri* (Fairm.), lately collected in Portugal by Mr. Lewis, in nests of the ant *Pheidole megacephala*, var. *pallidula.*

The Rev. W. W. Fowler exhibited *Staphylinus latebricola* and *Quedius truncicola*, both from the New Forest.

The Secretary exhibited, for Mons. H. de la Cuisine, of Dijon, coloured drawings, life-size, of a variety of *Urania Crœsus*, and a variety of *Papilio Memnon*; and Prof. Westwood made some observations on them.

Mr. G. Elisha exhibited specimens of *Antispila Pfeifferella*, together with the cases, and the leaves mined by the larvæ.

Mr. J. W. Slater read a paper "On the Origin of Colours in Insects," in which he showed that the assertion of Mr. Grant Allen, that all brightly coloured insects were flower-haunting species, was incorrect; and that many brilliantly coloured insects were carnivorous. Mr. McLachlan said that the physiological question in connection with colour had not been sufficiently considered: he thought that colour in many insects was to a great extent dependent upon the circulation of fluids in their wings. The discussion was continued by Prof. Westwood, Mr. Goss, The Rev. W. W. Fowler, Mr. Jacoby, and Mr. Weir.—H. Goss, *Secretary.*

NOTE ON SOME BRITISH *COCCIDÆ* (No. 3).

BY J. W. DOUGLAS, F.E.S.

Having now before me Foerster's little-known article "Ueber Schildläuse," to which I alluded from report only at p. 248, vol. xxii, with respect to the presumable identity of certain reputed species of *Lecanium*, I can revert to it with greater precision. He says:—

> "The male of all the species of this genus must be most carefully examined, for only on the fully developed males can the specific character be founded with certainty. The early writers, mostly without knowledge of the male, named the species after the plants on which the female was found, a mode of proceeding that necessarily led to many species being placed together as a single one, as I have fully proved." . . . .
>
> "With respect to the determination of the species, it is not difficult to distinguish the *Coccus tiliæ* of Réaumur and Linné, for the former has long ago given a figure of it in the 4th volume of his 'Mémoires;' but if it be agreed that the *Coccus tiliæ* of both authors is the same, so also it is incontestable that this *Coccus* is not limited to the lime tree only, but that it goes to other trees, and in each case is named differently in accordance with its habitat. In former time, and also again this year, I have observed it on the following, namely, *Populus tremula*, *Ulmus campestris*, *Acer pseudoplatanus*, and *Prunus padus*, also on pear and cherry trees. Further, it appears to me probable that *Coccus quercus*, *betulæ*, *carpini*, *coryli*, and perhaps also *oxyacanthæ*, Linné, must form one and the same species with that here treated on. Under these circumstances, the name *tiliæ* can no longer be retained, and I therefore allow myself to bestow on it a new one, which has reference to the wandering life of the species, and call it *Lecanium vagabundum*."*

The soundness of Foerster's theory in its entirety is invalidated by the fact that some of the species he mentions, as they are now understood, belong to the genus *Pulvinaria*, of which the female scales are remarkably different by having in their ultimate state a protruding ovisac, and therefore they cannot be identical with any true *Lecanium*. Such a proposition by one having such a nice power of observation as Foerster is incredible, and so it is most likely he had in view scales of species of true *Lecanium*, and that he misapplied to them the names he has quoted; thus he may have had scales of *Lecanium genevense* and called them *oxyacanthæ*, which is a *Pulvinaria*, both species feeding at the same time on one kind of tree. Linné did not describe his *Coccus oxyacanthæ* (S. N., 742, 21); he merely says "Habitat in *Cratægo oxyacanthæ*," and refers to "Réaumur, Ins.," iv, t. 6, f. 11, 12, which figures clearly denote a *Pulvinaria* with a protruding woolly ovisac; whereas, *L. genevense* has no external ovisac, and is a true *Lecanium*. Or it may be that Foerster only saw the scales of the

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* This is the name quoted by Kaltenbach in his "Pflanzenfeinde," of which Signoret had no trace (Ess. Cochin., p. 466).—J. W. D.

Pulvinaria, before the period of oviposition, then they might easily pass as a *Lecanium*. So also of the other *Pulvinariæ* he mentions. At any rate, with such reservations, the subject deserves investigation, for there may well be not so many species of *Lecanium* or *Pulvinaria* as is believed. Foerster's contention is that while different though similar species may feed on one kind of tree and get one name, yet, on the other hand, one species may feed on different kinds of trees and thus get several names.

Targioni-Tozzetti, in his "Catalogus," 1868, places together as one species (under the name *Lecanium ulmi*, Walker), without any mark of doubt, and apparently without knowing what Foerster had proposed, *Coccus ulmi*, Geoffr., *Coccus coryli*, Linn., *Chermes coryli hemisphæricus*, Geoffr., *Coccus tiliæ*, Linn., *Chermes tiliæ hemisphæricus*, Geoffr., and *Calypticus læris*, Costa, but leaving *Lecanium aceris* = *Coccus aceris*, Modeer, Fab., Gmel., Curtis, as a distinct species. Now, Walker (List of Hemipterous Insects in Brit. Mus., iv [1852], p. 1074, No. 33), merely cites *Coccus ulmi*, Linné, without giving any description or reference to the British Museum collection, and does not put any other reputed species as equivalent to it, quoting only the *ulmi* of the various authors who have described or noticed the species of that name; so that the reference by Targioni-Tozzetti to the *Lecanium ulmi* of Walker is misleading and futile, but this does not invalidate his opinion of the unity of the reputed species he mentions.

Signoret describes as distinct species, *L. aceris*, *æsculi*, *corni*, *coryli*, *genevense*, *pyri*, and *tiliæ*, allowing that they are much alike, but with certain small differences in the scale of the female or in the imago of the male deemed of specific value, and stating that they have in common on the "derme" of the scale of the female a microscopic tesselation.

The solution of these and other problems, *ut infra*, is within the reach of the younger men of this generation, but scarcely in the range of my own probabilities, which are within measurable distance of an end. Time is on their side but not on mine, for, as the French say, "*Quand on est mort c'est pour longtemps.*"

In the "Jahrbücher des nassauischen Vereins für Naturkunde," 1884, Dr. Rudolph Goethe has an article on the *Coccidæ* affecting fruit trees and vines in the Rhine district, illustrated with three plates, and the paper is in several respects of interest to us, as most of the species have been, or may be, found in Britain.

I note the following:—

Mytilaspis pomorum, Bouché.

Externally nearly all the forms of *Mytilaspis* are so very similar, that they might be believed to constitute but one species; but good characters for the separation of species exist in the pattern of the fringe of the last abdominal segment, and more especially in the number and relative position of the groups of the wax-excreting spinnerets on the inferior surface of the same segment. In the European species there are five groups—one anterior (mesal of Comstock), one on each side lower down (anterior-lateral), and one still lower (posterior-lateral). The number of spinnerets in each group is tolerably constant in a species, but it varies within certain limits, not only in the species, but even in the individual, for it is not always exactly the same in the corresponding lateral group.

For some years past I have known the scales of a *Mytilaspis* common on red and white currant bushes, and latterly I have found, but more sparingly, scales on the black currant, always on the two-years'-old shoots, all three agreeing exactly in external appearance and similarly not separable from *M. pomorum*, the species very abundant on apple trees. Dr. Goethe has examined the black currant form with reference to the formula of the spinnerets, and finds that they agree with the form on the apple, but he gives the number of spinnerets in the respective groups as 10, 18, 16, whereas Signoret gives them (for *pomorum*) as 17, 10, 14. This difference, however, is not of importance in a specific sense, for I find that, while the scales on the apple and black currant are identical as regards the fringe, the spinnerets in both vary in number in the respective groups, thus, 8—13 anterior, 14—21 ant. lat., 9—14 post. lat.* Comstock (Report, 1880) gives the numbers as 11—17, 16—21, 16—21 in the respective groups. Maskell (Trans. N. Z. Inst., xi, 194) gives the numbers, as shown by scales from apple, plum and lilac, as 17—20, 17—19, 14—17 respectively. There can be no doubt that Goethe's species is *M. pomorum*, Bouché, but he erroneously calls it *M. conchiformis*, Gmelin. [I may here mention incidentally that I find the *Mytilaspis* on the dogwood (*Cornus*) and plum trees to be identical with the species on the apple (*M. pomorum*) as to abdominal fringe and spinnerets; Bouché had stated they were the same species, but I apprehend without microscopic test.]

Mytilaspis linearis, Geoffr., Modeer.

Gmelin (Syst. Nat., 13 ed., p. 2221, No. 37, 1788) describes *Coccus conchiformis* in these words, "Habitat in ulmo, angustus, fuscus."

Signoret adopts the name for a species of *Mytilaspis* living on the elm, which he finds differs essentially from *M. pomorum*, Bouché, inasmuch as the spinnerets are 6—7, 8—9, and 5—6, in the respective groups. He admits, however, that at first he had been misled by Curtis in employing the name *conchiformis* for the apple feeder.

Réaumur expressly states that his figure t. 5, fig. 7 (Gallinsecte en forme de coquille) represents an elm-feeder, and the figure is cited by Gmelin; but he also gives as a synonym of his *conchiformis*, *Coccus arborum linearis*, Modeer, "Act. Gothenb.," i, 22, 14 (1778), and Geoffroy "Hist. abr. des Ins.," 569, 17 (1764). The latter quotes Réaumur, yet apparently losing sight of the restricted habitat on the elm, says vaguely "Celui-ci vient sur les arbres." He was the first to name Réaumur's species as *Chermes arborum linearis*. Modeer (*l. c.*) cites Réaumur and Geoffroy, dropping "*arborum*," and giving the name as "*linearis*" only (so that he was not correctly cited by Gmelin), and he says the insect "lives on the branches of elm trees." It thus appears that the prior name of the elm feeder is *linearis*, and it should not have been supplanted by Gmelin's *conchiformis*; thus also Signoret's *linearis* (*nec* Geoffr., Modeer, as he has it) requires another name. At any rate, Goethe's *conchiformis* is not the *conchiformis* of Gmelin. I find the true *Mytilaspis linearis*, Geoffr., Modeer, rarely on elms; I believe it is now first introduced as British, and that the *conchiformis* of Curtis and Walker is only *Mytilaspis pomorum*, Bouché, Signoret. Briefly the synonymy is:—Gallinsecte de coquille, Réaum. *Chermes arborum linearis*, Geoffr.; *Coccus linearis*, Modeer; *Coccus conchiformis*, Gmel.; *Mytilaspis conchiformis*, Sign.

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* Mr. G. S. Saunders has kindly given me the advantage of his extensive experience in the preparation of minute entomological objects by mounting these and other *Coccidæ* for microscopic examination.—J. W. D.

Mytilaspis vitis, Goethe, *sp. n.*

This form Dr. Goethe finds on vines, and it is not impossible that it may occur in Britain. The formula of the spinnerets is given as 9—11 anterior, 14—16 ant. lat., 10—12 post. lat., and the species is regarded as quite distinct from *M. pomorum*, which it resembles otherwise. The scales of the ♀ are found on the two-years'-old wood. The larvæ are attached to the young shoots, especially near the buds, where they are very perceptible, as the place where the rostrum is inserted becomes brown or blackish. With the discoloration a swelling is associated, so that the young creature sits on a small eminence.

Lecanium pyri, Schrank.

Dr. Goethe says he finds this not only as usual on apple and pear trees, but also on whitethorn; by the latter I apprehend he means *L. genevense*, Targ.-Tozz., which he does not mention by name.

Lecanium cerasi, Goethe, *sp. n.*

Dr. Goethe finds, principally on cherry trees, but also on plum trees, in the spring, female scales of a *Lecanium* which he says do not agree with any described by Signoret. They are 4 mm. long, 3 mm. broad, and 2½ mm. high, colour reddish-yellow, shining; the male, which appears in May, has white wings with a dark red spot between the margin and the nerve, body red-brown. I also find such scales here on the cherry trees, but have not been able to distinguish them from *L. pyri*, Schrank, nor do the scales or imago of the male afford any distinctive characters. As to the remark about the descriptions by Signoret it must be noticed that he only refers to the adult scales, the yellow colour mentioned by Goethe becomes brown in a short time, as in other reputed species of this group.

I also find similar scales on laurel (*Prunus laurocerasus*); I notice on the grey scales of the male that the oval coronet on the back shows distinctly white, as Signoret represents as existing in *L. prunastri*, but the imago differs not from *L. pyri*.

Lecanium variegatum, Goethe, *sp. n.*

This, it is stated, is found somewhat abundant on plum trees and apple trees, singly on the latter. The specific name is adopted, because the ♀ scales show a remarkable variegated coloration up to the time of oviposition. At first yellow-brown they become bright red, with a broad dark stripe lengthwise on the back, which is interrupted by fine white transverse streaks. At this stage the scales are nearly 3.5 mm. high, 4 mm. broad, and 4.8 mm. long, consequently very globular. With the development of the eggs they become tubercular, thin-shelled, uneven, furrowed and tumid, and the variegated colour merges into a shining brown-red. The young larvæ are dark yellow, and of a characteristic stumpy form. The male imago, found in April and May, has the body and head dingy red-brown, legs light yellow, antennæ dark brown, wings between the margin and nerve red-brown.

This may be a distinct species, not hitherto separated from *L. pyri*, for although generally not much importance is due to the variegation of the ♀ scales, which is more or less observable in all the reputed species of this group of them, yet the transverse white streaks appear to be special to the form now mentioned, and may prove to be a specific character. I find such scales here on plum and apple trees, and also singly on a pear tree, in May; but I have yet to learn how to distinguish the male from *L. pyri*.

Lecanium ribis, A. Fitch.

Under the head of *Lecanium persicæ*, Dr. Goethe introduces a form which he finds on gooseberry and currant bushes, which he is inclined to believe is identical with that species. Assuming that it is the same as that I find here common on gooseberry and currant bushes, I would rather believe it to be *L. ribis*, which is much more like *L. rugosum*, Sign., than *persicæ*, yet I think distinct. Like Dr. Goethe I have never found a male of this currant feeder.

8, Beaufort Gardens, Lewisham :
May 31*st*, 1886.

DESCRIPTION OF TWO NEW SPECIES OF *TERACOLUS*.

BY ARTHUR G. BUTLER, F.L.S., F.Z.S., &c.

The following interesting species have recently been presented to the Museum Collection by Mr. J. M. E. Johnston :—

Teracolus Johnstoni, *sp. n.*

♀. Allied to *T. Eris*, but larger and in some respects more like the female of *T. subfasciatus*; the apical border of the primaries being bright copper-brown instead of black, bounded internally by three diffused bright ochreous and one white spot in a curved oblique series, these again bounded internally by an oblique black band from costa to third median branch, the latter continued by two spots (the upper crescentic, the lower sub-quadrate) upon the median interspaces; the internal blackish streak narrow, and at its outer extremity curving up in the form of two unequal spots almost to the first median branch; secondaries of a dead white tint, slightly pink in certain lights, and with faintly yellowish border; the base slightly dusky; a transverse tapering bifid brownish dash from costal margin to second median branch: below the differences are even more marked, the apical area and costal margin of primaries being of a bright gravel-ochre colour; six brownish spots in a biangulated series from costa to first median interspace, and a brown spot at the end of the cell; secondaries entirely bright gravel-ochre, a spot at the end of the cell, the tapering costal dash of the upper surface and five inconspicuous spots in continuation of the latter coffee-brown; pectus clothed with salmon-pink hair. Expanse of wings, 56 mm.

Graham's Town.

In the Hewitson collection there is a pair of this species, mixed up with three or four other species, as *T. Eris:* the male differs from that sex of *T. Eris*, in having a conspicuous black spot at end of cell, the apical patch elongated transversely instead of along the costa, its outer portion cupreous on the border, grey-brown within the border, the spots upon it broad, oval and bright ochreous; the black externo-discal area inclosing two white unequal spots in continuation of the sub-apical series, and below these spots with a dentate-sinuate white border; the black costal band of secondaries is slightly differently shaped from that of *T. Eris*, and (as in the female) there are no marginal spots to these wings; on the under surface the primaries have a black spot at end of cell as above, also two small spots just beyond the centre of the median interspaces; the costal margin and apical area and the entire surface of secondaries deep rosy flesh-coloured; the secondaries with a tapering brown dash from costal margin, and a small brown spot at end of cell; pectus with pink hairs. Expanse of wings, 53 mm.

Hewitson has, as usual, no definite localities on his specimens, the male being labelled simply "Cape," and the female "S. Af."

The following, which is the largest species of the group, I describe as—

TERACOLUS OPALESCENS, *sp. n.*

♀. Nearest to *T. Maimuna* from Angola, considerably larger, the wings white with rosy opaline shot, much more pronounced, especially on the primaries, than in any other known species; primaries above with the costal border narrowly irrorated with brown scales, giving it a greyish tint; external and internal borders very broad, more so than in *T. Maimuna*, the three sub-apical yellow spots only represented by a few scattered yellow scales, but the white patch at external angle wider than usual; secondaries with the marginal spots unusually large; the spots across the disc forming a regular arch instead of an angle followed by an arch as in *T. Maimuna*, the first spot only large, the others quite small; primaries below white, the apical area tinted with clear sulphur-yellow, and not crossed by rust-red spots as in *T. Maimuna;* three spots only on the disc, two of which (on the median interspaces) are large; a transverse black stigma at the end of the cell; secondaries clear sulphur-yellow; a small red-brown spot at the end of the cell, and eight in an arched series from costa to interno-median fold across the disc; costal margin gamboge-yellow; body below white. Expanse of wings, 62 mm.

Delagoa Bay.

The female of *T. Maimuna* measures 57 mm. in expanse of wings; it is always more or less, and sometimes wholly bright yellow on both surfaces; when white above, it has three conspicuous yellow sub-apical spots, and the anterior half of the wing on the under surface washed with yellow; whilst the apical area of the primaries and the whole of the secondaries on this surface are bright golden buff approaching a mustard-yellow; the external border on the upper surface of the primaries is browner, and does not run so far along the costa, is narrower throughout, and the inner border is narrower, and fades away into greyish flesh-colour at the base in the Angola species. I therefore have not the slightest hesitation in considering these two to be abundantly distinct, though allied species.

As it appears to me to be always for the good of science to correct errors as soon as possible after their publication, as I have monographed the genus *Teracolus*, and, lastly, as the British Museum possesses the finest and most complete collection in the world of these beautiful butterflies, I think it my duty to add here a few notes upon the species figured and remarked upon by Dr. Staudinger in his work now publishing. I have no desire to dispute his right to place his species in three, or if he prefers it in more genera, but simply to point out a few inaccuracies arising from the effort to work out a difficult group with insufficient material.

On plate 23 of his work, Dr. Staudinger figures the following:—

1. *Idmais Eris*, Klug, ♂, correctly identified.

2. *I. Vesta*, Reiche, ♂. Our examples of *T. Vesta* are males, and correspond with the original figure; the species figured by Staudinger is perfectly distinct, and is my *Teracolus argillaceus;* it is considerably smaller than *T. Vesta*, the base of the wings above is not black as in that species, the apical area of primaries and entire surface of secondaries below are pinky-ochraceous, instead of pale sulphur-yellow, and the central band of the latter wings is the only dark one, though Staudinger's figure fails to show this difference.

3. *I. Pleione*, Klug, ♂, correctly identified.

4. *I. costalis*, Stgr., a new species allied to *vestalis*.

5. *I. venosa*, Stgr., ♂. This appears to me to be allied to *Belenois Charina*, but to be figured from an example in which the antennæ are broken short off: if this is so, we have a nearly allied species from the Nyanza; ours is, without question, closely related to *B. Charina*.

6. *Teracolus subfasciatus*, Swains., ♂, correctly named.

7. *T. protomedia*, Klug, ♂. The insect figured is a female; we have a series of both sexes.

8, 9. *Callosune Jobina*, Butl., ♂, ♀, correctly named.

10, 11. *C. Jalone*, Butl., ♂, ♀, apparently rightly named, but not well figured.

12. *C. Amina*, Hew., ♂, correctly named.

13, 14. *C. cinerascens*, Butl., ♂, ♀, correctly named.

15, 16. *C. Auxo*, Lucas, ♂, ♀, correctly named.

17. *C. Achine*, Cram., ♂. The species figured is the *T. Omphale* of Godart.

18. *C. Haevernichii*, Stgr., ♂. This is the male of my *T. harmonides*.

19. *C. Gavisa*, Wallgr., ♂, correctly named.
20. *C. vulnerata*, Stgr. Possibly the male of my *Teracolus incretus.*
21. *C. Danaë*, Fab., ♂, correctly named.

In conclusion I would remark that personally I see no grounds, upon the variable and purely specific differences indicated in Dr. Schatz's figures of three isolated species, for separating the genus *Teracolus* into three.

British Museum :
March, 1886.

DESCRIPTION OF TWO NEW SPECIES OF *PIERIDÆ* FROM ZANZIBAR.

BY H. GROSE SMITH, F.E.S.

MYLOTHRIS SAGALA.

Upper-side.—Anterior-wings white, irregularly irrorated with brown-black, especially on the costa, in the cell, and towards the base, where the irroration is so close that the wings are nearly brown-black. Posterior-wings yellow; the base and an irregularly defined space near the apex, between the costal nervure and the first sub-costal nervule, thickly irrorated with brown-black; minute black spots on the margin at the end of the nervules.

Under-side.—Anterior-wings white; costa grey; apex faintly tinged with yellow. Posterior-wings yellow, with small black spots on the margin at the end of the nervules. Expanse of wings, 2⅛ inches.

Habitat: Sagala, about 100 miles inland west from Zanzibar.

In the collection of H. Grose Smith.

TERACOLUS CALLIDIA.

Upper-side.—Dusky white, irrorated at the base with black. Anterior-wings with a yellow-ochre apical patch extending over one-third of the wings, margined internally with a dusky black band, the costal and exterior margins, nervures at the exterior margin, and a spot at the end of the cell, dusky black. Posterior-wings with a black spot near the centre of the costal margin, and marginal spots at the end of the nervures.

Under-side.—On the anterior-wings the apical patch is indistinct and paler without the internal band, but crossed in the centre with an angulated row between the nervures of five dusky black spots, a spot at the end of the cell, and a dusky black band at the base. Posterior-wings brownish-white, a yellow-ochre spot between two brown spots on the upper discocellular nervule, and a curved row of spots from near the centre of the costa to near the anal angle. Expanse of wings, 2 inches.

Habitat: Zanzibar.

In the collection of H. Grose Smith.

London: *April*, 1886.

NOTES CONCERNING *CHRYSOPA VENTRALIS, PRASINA, ABDOMINALIS, ASPERSA*, AND *ZELLERI.*

BY ROBERT McLACHLAN, F.R.S., &c.

The question of the specific distinction, or otherwise, of the conditions bearing the above names has long engaged my attention, and that of other European entomologists interested in *Neuroptera-Planipennia.*

Very recently, circumstances induced me to give the subject more special investigation, and the remarks I here offer may be of interest, even if my conclusions do not meet with universal acceptance.

Those who have paid some attention to European *Chrysopæ* will recognise the names enumerated above as representing a group of species, varieties, or conditions, characterized by the wings having a partially black and partially pale neuration, *with a (usually) conspicuous black dot at the extreme base of the costa: a black point between the antennæ;* two black marks on either side of the face (on the genæ and clypeus respectively); the palpi annulated with black; the pronotum above with black (or blackish) points (often connected into two longitudinal lines), and with two or three black spots (occasionally connected) on its edges. These characters are common to all, but there are often additional points on the basal joint of the antennæ, on the vertex, on the mesothorax, &c. And the whole question virtually concerns the amount of importance to be attached to the number and position of the black points on the head, thorax, and abdomen, and the condition of the black variation in the neuration. All seem to agree in form, and in special structure (so far as this can be ascertained). If I mistake not, far too much importance has been given to "spotting" in differentiating European *Chrysopæ*, and the same remark probably obtains with equal force in extra-European forms, notably in the North American group of which *Ch. oculata*, Say, may be taken as an example.

CH. VENTRALIS, Curtis (Brit. Ent., pl. dxx, 1834).—I place this first in order of precedence in these notes, because if all the five forms here considered be eventually regarded as only conditions of *one species* (which I think probable), the name *ventralis* has the right of priority. The form is especially remarkable for the *ventral surface of the abdomen being black* (excepting at the apex), but with the segmental divisions conspicuously pale during life; the prosternum is partially (or nearly wholly) black or blackish (the colour often forming a Y-shaped marking), and there are usually conspicuous black marks above the insertion of the coxæ on the mesosternum. There is occasionally a black point on the basal joint of the antennæ, and in some examples (from England, Holland, France, and the Rhine Valley) I see two black points on the head posteriorly (compare remarks on *Ch. Zelleri*). The neuration varies in the amount of black and pale. *Ch. ventralis* is var. 7 of *aspersa* in Schneider's Monograph (p. 112). It is widely distributed, but localized, and, according to my experience, never presents any intermediate conditions in ventral coloration, and on this character one is never in doubt in determining it.

Ch. prasina, Burm. (Handbuch, ii [2], 981, 1839).—This ranks next in order of priority, and heads the series of *prasina*, *abdominalis*, *aspersa*, and *Zelleri*. Having stated that *ventralis* never leaves one in doubt (be its position specific or varietal), we are now confronted with distinct difficulties. Latterly it has been the custom to unite *prasina* and *aspersa*, and I have more than once strongly urged their union. Recently I resolved to obtain a sight of Burmeister's type if possible, and placed myself in communication with Dr. O. Taschenberg, of the University of Halle, who took infinite trouble to help me, and lent me what no doubt is the original type, though Burmeister, probably subsequently, appears to have confused *aspersa* and *septempunctata* (the specimens bear no labels on the pins). The type may be the specimen figured by Schneider, or the latter author may have used one of the few other specimens to which he refers (Monogr., p. 111). The type is in good condition (but bleached by age), and agrees sufficiently with Schneider's definition and figure, save in one matter, and that is important. The abdomen is not discoloured (which happens too frequently in dried specimens of *Chrysopæ*), and it shows (unless I am very much mistaken) decided indications of the dark markings on either side of the dorsum characteristic of *abdominalis*. The coloration of the neuration agrees with Schneider's description and figure. Schneider points out the totally black transverse neuration, and the two brown lines on the pronotum as especially serving to distinguish *prasina* from *aspersa*, the importance of which I fail to realize after an examination of a very long series of the latter; nevertheless, I do not feel sure that I have seen any other specimen *precisely* agreeing with Burmeister's type.

Ch. abdominalis, Brauer (Neurop. Austr., 61, 1859: a modification of *Ch. abdomine-punctata*, Brauer, Haidinger's Abhandl., iv, 1850, where there is a figure). I place this name in the present sequence for special comparison with *Ch. prasina*. My recent endeavours to elucidate the specific position, or otherwise, of *abdominalis* formed the *raison d'être* of this short memoir. It is to be remarked that Brauer, in his "Neuropteren Europas" (Festschrift, z.-b. Ges. Wien, 1876), in analyzing the Austrian species, says of *abdominalis*:—"Ich halte sowohl diese als auch die vorige Art (*prasina*) nur für Varietäten von *Ch. aspersa*, Wesm." The principal point in Brauer's earlier descriptions is the existence of elongate brown markings on either side of the dorsum of the abdomen. I have shown that these apparently exist in the type of *prasina*; I will show later on that they exist in *Zelleri*. In the "Neuroptera Austriaca" we also find allusion to the black commencement of the sector radii, and of the upper cubitus. It is well to remark that I have not seen an actual type of *abdominalis*. At one time I temporarily rejoiced in the discovery of what appeared to be a good character (not noticed by Brauer), but the illusion was soon dispelled. I possess examples from Saxony sent by Rostock as *abdominalis*; I have seen one from the same source, and also from Burgdorf, Switzerland (Meyer-Dür), from Albarda's collection; in 1885 I captured in Holland, and in the Schwarzwald, isolated examples. Presuming the abdominal markings are present in all of these (they are so in those in which the abdomen is not discoloured), they are peculiar, inasmuch as (with the greatest general resemblance to the type of *prasina*) they agree in having the basal portion of the sub-costa *continuously black for a short space* in both pairs of wings. But Albarda forwarded other examples (from Burgdorf) as probably *prasina*, in which this condition existed only in the anterior-wings.

CH. ASPERSA, Wesmael (Bull. Acad. Brux., 1840, 210).—The conditions noticed under *prasina* and *abdominalis* appear to be comparatively rare (not yet noticed in Britain). But excluding these (and *ventralis*) there exists a somewhat protean mass of conditions ordinarily grouped under "*aspersa*." The size varies enormously; so also do the thoracic spots; so also does the amount of black coloration in the neuration, but, *as a rule*, the transverse nervules are only black at either end; the basal joint of the antennæ has sometimes a black point (= var. 6 of Schneider); and certainly the dorsum of the abdomen is often spotted (but the spots, if I mistake not, are in this case smaller and more numerous than as noticed for *abdominalis*, &c., and do not appear in the very numerous dry examples before me). Allowing for all variations, it is the most common and dominant condition.

CH. ZELLERI, Schneider (Monogr., 114, pl. 38, 1851).—The main distinguishing characteristic of this is the presence of two black points on the posterior portion of the top of the head ("*in vertice duobus punctis*," Schneider). The other characters given by Schneider, such as the dark line on the outside of the basal joint of the antennæ, &c., are certainly variable. It is probably mainly (but not entirely) a meridional condition. Zeller captured it in Sicily, and I have examples from him. I have stated that the two black vertical points sometimes exist in *ventralis*. Albarda tells me that in examples of *Zelleri* (from Hyères) there are faint indications of the dark points above the coxæ on the mesosternum noticed under *ventralis*; these do not exist in any one of the five examples in my collection. But I have an Italian specimen forwarded by Prof. Costa as a *type* of his *Hemerobius Ramburii* (although it is his *H. neglectus* that should have the two spots on the top of the head, according to his description), which most distinctly shows the abdominal spots as in *abdominalis* (these are not visible on my other examples), and Albarda says they are equally present in his examples from Hyères.

The foregoing is an attempt to elucidate a critical question as to how far variation *may* have been made subservient to specific differentiation, and, if I mistake not, it might be extended to double the length here given. Possibly my ideas may eventually prove to be in part erroneous by a careful examination of *structural sexual characters* in living specimens (I fail to detect such in dry individuals). Moreover, there remains the test of breeding from eggs. The larva would appear to differ from others of the genus by its shorter and broader form, and its habit (Brauer) of covering itself with the skins of the Aphides, &c., it has sucked; a habit common in *Hemerobius*, but possibly not otherwise noticed for *Chrysopa*.

In the absence of any data to the contrary, the subject may at present be closed as follows:—

(1.) With the exception of the ventral and prosternal peculiarities exhibited in *ventralis*, all other characters seem to be essentially variable and often interchangeable.

(2.) There appears reason to believe that *all* the conditions may be only varieties of one species, for which the name *ventralis* has the right of priority.

(3.) Admitting *ventralis* as distinct, the others are varieties of one species, for which *prasina* should be adopted.

In concluding these notes, it remains to me to acknowledge the great assistance I have received from my correspondent Mr. Herman Albarda, of Leeuwarden, to whom I am indebted for help to the extent that some portion of the notice may be regarded as a joint production. It is essentially a critical subject, and one on which I have the highest regard for Mr. Albarda's critical acumen. He was so kind as to look through a preliminary draft of these notes, and I have embodied most of his suggestions; which, moreover, caused me to re-examine my materials, and, in so doing, additional points of importance were discovered.

Lewisham, London:
June, 1886.

ON SOME POINTS OF VARIATION IN *CHRYSOPA SEPTEMPUNCTATA*, WESM.

BY ROBERT McLACHLAN, F.R.S., &c.

Chrysopa septempunctata is a widely-distributed species in the limits of the European Fauna, and, though by no means confined to gardens, a common garden insect, and one of the most evil-smelling of its genus. Its specific name is derived from the presence (ordinarily) of *seven* black markings on the face, viz.:—a usually large and often ovate spot between the basal joints of the antennæ, a more or less lunate spot below (or before) each basal antennal joint, a more or less rounded spot on the genæ on either side, and a streak on either side of the clypeus. Excepting differences in the size of individual examples of the insect, the variation mainly concerns these spots on the face. Schneider (Monogr., p. 102) recognised two such varieties, viz.:—

> "Duobus punctis nigris ante antennas deficientibus: varietas *quinque-punctata*, mihi.
>
> Etiam puncto nigro inter antennas deficiente: varietas *quadri-punctata*, m."

Of his var. 4-*punctata* I have never seen an example ; of his var. 5-*punctata* I have seen many, and captured a characteristic specimen with my hand in my garden as it was flying here (Lewisham) one evening early in the present month of June.

But the *size* of the spots (independently of the absence of some of them) varies enormously, especially that between the antennæ and the pair immediately below (or before) the antennæ, and all may be reduced to mere points, or may be very large and conspicuous. In some specimens from Switzerland (Meyringen and Sierre) the spots are *very* large, and occasionally *the spots on the genæ are connected with the streaks on the clypeus*, forming one enormous spot of irregular form.

In the var. 5-*punctata* the spots are usually very small, reduced to points ; and I am now of opinion that *Ch. centralis*, McLach., from Turkestan, described by me in Fedtschenko's voyage, can be only regarded as identical with *Ch. 7-punctata*, var. 5-*punctata*. As my original description of *centralis* was translated into, and published in, Russian (and, therefore, not to be understood, even by myself), I append a copy of the note attached to the description from the original MS. (which I fortunately preserved).

> "The species is clearly allied to *C. septempunctata*, but differs in wanting the black spots below the base of the antennæ, and in the small size of the other black spots. It is also allied to the Japanese *C. cognata*, but that species has no spot between the antennæ. All may possibly be local modifications of *C. septempunctata*."

I am not sure that I have seen typical *Ch. 7-punctata* from Turkestan, but the var. 5-*punctata (centralis)* has also been received thence from another source, and is in Albarda's collection ; it may probably be the dominant condition there.

An example from Eastern Siberia, that I can only refer to *Ch. 7-punctata*, has the spots on the genæ virtually obsolete, but the other spots conspicuous.

It would appear that *Ch. pallens*, Rambur, described from a single example from Spain, and now generally united with 7-*punctata*, is really of the var. 5-*punctata*, for Schneider says, "stria arcuata ante antennas deficiente." Hagen makes no allusion to the spots in his notes on the type in Stett. Zeitung, 1866, pp. 298, 299.

It is well to allude here to *Ch. bipunctata*, Burm., from Japan, and *Ch. cognata*, McLach., from Japan, China, and Cambodia. According to Schneider's detailed description of the type of *bipunctata* (Monogr., p. 104), the face should have seven spots as in 7-*punctata*, the main difference being in the form of the spot below the basal joint of the antennæ, which he defines by "stria arcuata," but the same definition would apply to the form of these spots in many European specimens of 7-*punctata*. I have many specimens of *Chrysopa* from Japan, but not a typical 7-*punctata*, nor anything which Schneider's definition of *bipunctata* will suit. Of *Ch. cognata*, McLach., I have many examples. It has all the general form of 7-*punctata*, but the spot between the basal joint of the antennæ is totally absent, and there are only four spots on the face, viz. :—one (usually large and lunate) below (or before) the basal joint of each antenna, and a short broad streak on either side of the clypeus (the spots on the genæ being absent).

Lewisham, London :
June, 1886.

Discovery of the Trichopterous genus Calamoceras in Central France.—The genus *Calamoceras* is essentially interesting as being the sole representative in Europe of a section or group of forms otherwise exotic. It was constituted by Brauer (Reise der "Novara") on a damaged ♀ from Gibraltar, which he named *C. marsupus*. Subsequently the late M. Camille von Volxem discovered the genus in South Portugal, and as his examples appeared to be distinct from Brauer's type (a point concerning which there is still need for elucidation), I described them as *C. Volxemi*. The Rev. A. E. Eaton, during his tour in Portugal, found *C. Volxemi* in several localities in some numbers. But the genus appeared to be confined to the Iberian Peninsula.

My valued correspondent, M. René Martin, of Le Blanc (Indre), France, recently sent me a few *Trichoptera*, &c., from his locality, and among them are two specimens of a *Calamoceras*, not in very good condition, which I fail to separate specifically from *C. Volxemi*. This is an exceedingly interesting point in geographical distribution. Originally recorded from the extreme South of Spain, in lat. 36° 10′ N., the most northerly of Mr. Eaton's localities was Villa Real, in about 41° 20′ N. M. Martin's locality, Le Blanc, lies in about 46° 35′ N., nearly in the centre of France, and of course with the Pyrenees intervening between it and the more southern localities. At present M. Martin mainly confines his attention to the Dragon-flies, and from the species that occur with him (and the dates of first appearance), there is evidence that his district has a climate more meridional than its situation would lead us to suspect.—R. McLachlan, Lewisham, London : *June* 12*th*, 1886.

Kolbia quisquiliarum, Bertkau, a genus and species of Psocidæ new to Britain.—When in Glasgow last autumn I noticed in the rich collection of Mr. J. J. King, a single example of a species of *Psocidæ* which, at that time, I identified as *K. quisquiliarum*. It was taken by Mr. King near Lyndhurst, New Forest, in August, 1879. He recently sent up the specimen, and I was able to confirm my previous identification ; moreover, it has been seen by Herr Kolbe, with the same result. The genus (and species) was first described by Dr. Bertkau in the Verh. Ver. pr. Rheinlande, xxxix, p. 129 (1882). He found it in Rhenish Prussia, from June to October ; Herr Kolbe has also found it near Berlin. The genus is allied to *Cæcilius*, and the arrangement of the neuration is somewhat similar ; but the pterostigma is more elongate and less dilated. An important character is that the wings of the ♀

are only rudimentary, whereas they are developed in the ♂. The wings have no markings, but the neuration is very strong and dark, and furnished with long hairs. The size about equals that of *C. obsoletus*, &c. The habits are peculiar, as it is found under stones and amongst dry rubbish (hence the specific name), dead leaves, &c. No doubt it only requires searching for in order to be re-discovered in this country; and there are several other recently-described European genera and species of *Psocidæ* of somewhat similar habits that no doubt also occur with us.—Id., Lewisham, London: *June* 16*th*, 1886.

Cæcilius piceus, Kolbe, and C. Burmeisteri, Brauer, in Scotland.—I found the two species above named very commonly by beating Juniper during the month of August, near Insh, Inverness-shire; *C. piceus* was very abundant at a spot within a few yards of the village.—James J. F. X. King, 207, Sauchiehall Street, Glasgow: *June*, 1886.

Notes upon the capture of Coleoptera during flight.—Amongst the varied methods of capture adopted for *Coleoptera*, the above appears one that is seldom made use of, at any rate by young collectors; and as I have found it yield good results, I thought it might be of interest to mention a few of the conditions conducive to its successful employment.

Any attentive observer of Nature cannot fail to have noticed upon a fine spring or autumn day the immense amount of insects that fill the air. To most persons they appear to be flies, but examined more carefully, they will be found to consist principally of *Coleoptera*, the major portion belonging to two divisions, viz., *Brachelytra* and *Lamellicornia*.

With these, however, many representatives of other groups will be found associated. There will be noticed a very marked dissimilarity of flight, and it is to this point I would draw particular attention; indeed, the various genera appear to possess as distinct an individuality in their mode of flight as in other respects—some darting along with great velocity hither and thither, apparently quite regardless of obstacles; others again, with more deliberation, wheeling round and round in large or small circles, or hovering, as it were, over some particular spot. Broadly classed, the *Adephaga*, *Brachelytra*, and *Lamellicornia* are the swift; whilst members of the *Clavicornia*, *Rhynchophora*, *Longicornia*, *Sternoxi*, &c., are slower and heavier fliers; the *Heteromera*, *Malacodermata*, and *Teredilia* being the hoverers. Of course there are exceptions, but after four years' careful study, the above seems generally the rule.

As in peculiarity of flight, so in time; the various species seem to have special hours. Wind, too, exercises great influence—a warm, slightly hazy afternoon, with a quiet south-west breeze, being the most advantageous; so important, indeed, is it, that upon a sudden change taking place, the effect is instantaneous, and the insects vanish "like the morning mist." The following list will serve to indicate a few of the species likely to be obtained, together with their times of appearance:—

10 a.m. to sunset, spring: *Amara bifrons*, and many others of the genus; *Trechus rubens*, *obtusus*, and *minutus*, species of *Cercyon* and *Hydradephaga* very abundant.

Brachelytra, examples too numerous to detail, especially, however, *Deleaster* *dichrous*; of this I have taken at various times nearly three dozen, always flying, nor have I ever succeeded in finding it otherwise; this species occurs from 5 to 7 p.m. in spring.

About the same time, viz., 5 to 7 p.m., the following have occurred to me:—*Philonthus villosulus*, *procerulus*, *agilis*, *sanguinolentus*, &c., &c.; *Lithocharis ochracea* and *melanocephala*; many species of *Homalium*, &c.; also *Euplectus signatus* and *sanguineus*, *Euthia plicata*, and *Colon angulare* and *brunneum*; these usually fly after 6 p.m., together with *Agathidium nigripenne*, and various others of the section; nor must I omit *Epuræa parvula*, *pusilla*, and *oblonga*, *Rhizophagus dispar* and *cribratus*, *Pediacus depressus*, and *Silvanus unidentatus*, together with many of the *Cryptophagidæ*.

Still later, say about 9 p.m., usually in autumn, *Helops atra* and *P. Stephensii*; and a little earlier, about 8, *Salpingus ater* and *castaneus*, *Lissodema Heyana*, *Orchesia minor*, *Hallomenus humeralis*, *Lyctus canaliculatus*, &c.

But it is useless extending the list further; what I have named will show, that given a quick eye and a suitable locality (an old wood yard is a fine place), assisted by a small gauze net, many additions can be made to a collection which are rarely otherwise obtainable.—A. Reston, Park House, Stretford, Manchester: *April*, 1886.

Ægialia rufa, *Fab.*—Saturday, June 5th, being a bright, warm day, I went to the Wallasey Sandhills to look for *Æ. rufa*, and was not disappointed. It appears to be very local, as it is almost entirely confined to one part of the sands. Can any Coleopterist inform me whether it has ever occurred in Britain anywhere, except on the Cheshire coast?—R. Wilding, 40, Downing Street, Liverpool: *June*, 1886.

Barypeithes pellucidus, *Boh.*, *near Margate.*—I have lately discovered this species in great profusion upon the shore between Broadstairs and Margate. The first specimens, which I did not recognise at the time, I found beneath stones, generally in couples. After working a few square yards of ground, however, I came upon the beetle in abundance, taking as many as fifteen from one small hole. The majority were lying fully exposed upon the sand, some feigning death, and others leisurely strolling along. How they came to be there I could not find out. I took nearly five hundred in all, and could easily have taken as many again; on passing by the spot three days later, however, scarcely a specimen was to be seen.—Theodore Wood, St. Peter's, Kent: *June 14th*, 1886.

Melanism in Hibernia progemmaria and Diurnea fagella.—Until the spring of this year, I suppose it must be towards twenty years since I went out to collect *Hibernia progemmaria*. For several years, however, in consequence of the number of specimens of the very dark form known as variety *fuscata*, which I had seen and heard of in the district, I had suspected the form had become much commoner than it used to be; so, to satisfy myself on the matter, on the evening of the 2nd of April, and again in the afternoon of the day following, I paid a visit to an elm plantation, bordered on one side with a hawthorn hedge, where I used to find my darkest specimens. The result more than confirmed my suspicion, for the dark specimens were not only in much greater proportion, but considerably darker than I had ever noticed them before. What we used to call "black females" formerly, had always, so far as I had noticed, a yellowish-brown edging to all the wings, but now many of them were almost sooty-black all over—head, abdomen, and wings, the former pale border being indicated by being of a slightly browner shade than the rest of the wing, though in some that was hardly noticeable. The females in the day time sit on the elm trunks, where it requires close searching to detect them. A ♀ of the ordinary type can be seen readily many yards from the tree on which it may be sitting; but the var. *fuscata* assimilates so closely to the bark, that one I found at rest in the afternoon, on taking off my eyes to get a box for it, I was some little time before I could detect it again, though within a few inches and directly in front of it all the while. In this plantation I think fully two-thirds of both ♂ and ♀ noticed were *fuscata*. I have now a batch of full-fed larvæ from a very black ♀ I found paired with as dark and unicolorous a ♂ as ever I found; and another lot from several females, but of which I do not know of what form the ♂ parents were, and await the result with great interest as to what proportions of dark and ordinary forms emerge from them.

After such an experience I determined to carry my investigations a little further, and this time on *Diurnea fagella*. I am not so sure about this species as the other, as formerly I was not at all interested in Micros; I am, however, tolerably certain that I used to see the ordinary pale grey form in fair proportion to the dark form on the trees in our woods, and this opinion is fully borne out by Mr. S. L. Mosley of this town (who also agrees with me about the *progemmaria*), with whom I had a talk on the subject. On the morning of Easter Monday, April 27th, and after dark on the following evening, I picked off 120 specimens of *D. fagella*, of which, probably, 50 were females, and out of the lot, two only, one of each sex, were of the pale type, the almost black form being in very large proportion.—Geo. T. Porritt, Huddersfield: *June* 14*th*, 1886.

Protective mimicry in a moth.—Walking up Camberwell Grove the other afternoon, I suddenly became aware of a lovely and perfect specimen of *Smerinthus tiliæ* sitting on the trunk of one of the lime trees about five feet from the ground. It was, to me, so conspicuous on the dark trunk, that I puzzled much over the fact that it must have been there for some time, probably hours, and had evidently been overlooked by all the passing boys, to whom it would surely be a prize, if only for the pleasure of destroying it. At last, when looking about, I found out the reason.

The limes just breaking out into abundance of foliage produce leaves from little buds here and there on the trunks. These leaves nearly always appear *in pairs* and point *obliquely downwards*, so that they form a most curious resemblance to the wings of the moth, are placed at precisely the same angle, and when only half expanded have the same straight costal edge and scalloped margin.

To a casual glance the resemblance is most striking, and a casual glance is all that is bestowed by the majority of passers on anything so unimportant as a tree or its leaves. This instance of protective mimicry is quite new to me, and exceedingly interesting.—C. G. Barrett, Camberwell Grove, S.E.: *May* 18*th*, 1886.

Tephrosia crepuscularia and biundularia.—A friend has just sent me specimens from Derbyshire of the dark grey variety of what I should have called *biundularia* certainly, but they were taken on *April* 12th and 24th. They are beautiful dark grey specimens, smaller than ordinary examples of either form, and certainly bearing no more resemblance to one than to the other, but their time of emergence is precisely that of the form or species which we call *crepuscularia* (formerly *laricaria*). If, on account of difference of colouring, we still continue to look upon *crepuscularia* and *biundularia* as distinct species, we shall, for the sake of consistency, be compelled to make one or two more species to admit these grey and blackish forms.—Id.

The male of Formicoxenus nitidulus, Nyl.—In vol. xx, p. 16, of this Magazine, I pointed out that Mons. E. André had shown in his "Species des Formicides d'Europe," that the male of *Formicoxenus* was still unknown to collectors. Mons. André has, however, in his First Supplement, p. 11, published last October, described the sought-for male, which has been discovered by M. Gottfried Adlerz, and was described by him in his "Myrmecologiska Studier," Öfv. af Kongl. Vet. Akad. Forh., 1884, p. 43. For the benefit of our English Hymenopterists I therefore give a translation of the chief distinguishing characters of this male, and I fancy that, in all probability, it may be found in many collections mixed with the workers, which it seems so closely to resemble.

Formicoxenus nitidulus, Nyl.—♂. Exactly like the ☿, except the following characters: head more narrowed behind, which gives it a more oval form; mandibles very short, narrow at the apex, which is obliquely truncate, its apical angle projecting in a blunt tooth; ocelli small, but always distinct; antennæ of twelve joints (the worker has only eleven), the scape shorter and thicker than in the ☿, never more than half the length of the flagellum, the basal joints of the latter are longer than in the workers, and the joints of the club are narrower, in fact, the club is not well defined, and might be held to consist of four or five joints; thorax like that of the ☿, but rather longer; no wings or alar articulations; abdomen with the petiole like that of the other sex, and with five segments beyond it, which are slightly narrower than in the ♀ or ☿; genital armature small.

M. André also observes that, according to M. Adlerz, there exists in every colony of *Formicoxenus* a certain number of specimens intermediate in the form of the thorax and in the development of the ocelli and genital organs, between the males and the workers, and that therefore these characters cannot be relied on to distinguish them, but that the number of abdominal segments and antennary joints, as well as the shape of the mandibles, remain constant.—Edward Saunders, St. Ann's, Mason's Hill, Bromley, Kent: *May 18th*, 1886.

The female of Crabro signatus, Panz.—The male of this rare species is so distinct from all its allies that there is scarcely any chance of its being overlooked, its rounded curved posterior tibiæ, and the little spine on the posterior femora at once affording characteristic distinctions, but with the female things are very different. It resembles that sex of *dimidiatus* so closely that it requires a very careful examination to detect its characteristics. There is a something in the general build of the insect that makes it look distinct, and yet it is not easy to point out in what the distinction consists. Mr. Harwood has very kindly given me the only female which he has captured at Colchester, where he has also taken the male, and after a careful comparison of it with ♀ *dimidiatus*, the following characters appear to me to be of value in distinguishing it:—

1st. The impressions on the vertex, as observed by Wesmael, are each divided diagonally by a raised line, but I do not fancy that this character is a very reliable one, as in some specimens of *dimidiatus* the origin of such a line can be distinctly traced.

2nd. The posterior tibiæ are more rounded and less spinose: in *dimidiatus* there is a sort of crest down the centre of the tibia, from which some of the spines seem to spring; this is much less developed or nearly obsolete in *signatus*, and the tibiæ are not marked with black.

3rd. The basal segment of the abdomen is shorter, and its sides converge more rapidly to the base, and so make the waist shorter.

4th. And what seems to me to be the most important character of all, the meta-thorax is shorter, and slopes more abruptly down to the point of junction with the abdomen; it is this character, easily perceived if the insects are examined sideways, which, I believe, gives to *signatus* ♀ its peculiar shape.

I fancy that *signatus* ♀ is very probably mixed in collections with *dimidiatus*, and that it would be discovered in many localities if its distinguishing features were better known.—Id.: *June* 14*th*, 1886.

Scottish Hemiptera.—Since the death of Mr. George Norman in 1882, no one appears to have collected *Hemiptera* in Scotland, and yet there is reason to believe that his somewhat desultory though continued attention to this Order, producing as it did a good many rare species, did not exhaust the novelties, and that there yet remain a number of species that are desiderata, even of those that have been found sparsely. Surely among the Scottish entomologists there are some that without any special search find *Hemiptera* it would be very easy to bottle for their friends, if they did not keep them for themselves; this latter, however, if they once began to get them would, I hope, happen. There are a good many species that are mostly or only found in the North; I mention a few of them, but others not now known as boreal will be sure to occur, for it is the unexpected that mostly happens.

HETEROPTERA.

Clinocoris griseus, Linn. (*cf.* vol. xxii, p. 37), on birches.

Phytocoris pini, Kbm., Scotch fir, August.

Deræocoris alpestris, Fieb., woods, July.

Orthotylus flavinervis, Kbm., on Wych elm (*Ulmus montana*), July and August.

Conostethus brevis, Reut., saline places, August.

Plesiodema pinetellum, Zett., Scotch fir, June.

Agalliastes Wilkinsoni, D. & S., moss in grass in woods, May, June.

Bothynotus pilosus, Boh., on moors 1500 feet up.

Temnostethus nigricornis, Zett., Scotch fir, June.

Acompocoris alpinus, Reut., firs, June.

Salda morio, Zett.; ***scotica***, Curt.; ***conspicua***, D. & S., on elevated moors, June, July.

Corixa venusta, D. & S.; ***socia***, D. & S.; ***sodalis***, D. & S.; ***vernicosa***, Walleng.; ***variegata***, Wall.; ***cavifrons***, Thoms.; in mountain lochs and streams, August and September.

C. Boldi, distinguished from all others by the markings on the clavus being longitudinal instead of transverse, it is very desirable to obtain if possible. It is known only by a single example taken in the North of England.

HOMOPTERA.

Acocephalus histrionicus, Fab.
Agallia brachyptera, Boh.
Thamnotettix melanopsis, Hardy; *torneella*, Zett.
Athysanus depressus, Scott; *irroratus*, Scott; *piceus*, Scott.
Orthezia cataphracta, Shaw, and *O. floccosa*, De Geer, the males have been seen alive only by the late Mr. G. Norman; I have but a single poor example, but they are stated not to be rare in September on short grass near Pitlochry.

The above is merely a mention of the names of such species as now occur to me; a full list of Mr. Norman's captures will be found in the Ent. Mo. Mag., xvi, 175 and 213, and xviii, 276.

The following have not yet been found in Britain, but as they inhabit the north of Europe it is very probable they are in the Highlands of Scotland:—

Ommatidiotus dissimilis, Fall., moors, June to September.
Bathysmatophorus Reuteri, Sahlb., on sallow and *Ledum*, June, July.
Trioza acutipennis, Zett., in damp meadows and on spruce firs, May to October.
—J. W. DOUGLAS, 8, Beaufort Gardens, Lewisham: *February* 13*th*, 1886.

Obituary.

Dr. John Arthur Power died suddenly at Bedford on Thursday, June 9th, aged 76. He was formerly fellow of Clare College, Cambridge, having been a Wrangler, and having obtained a Second Class in the Classical Tripos; he adopted the medical profession, and for about forty years was one of the best known and most successful medical tutors in London, especially in connection with the Examinations for the Indian and Army Medical Departments; while at Cambridge he took up the study of *Coleoptera*; the earliest entry in his journal is "Burwell Fen, June 11th, 1835;" but he had previously (June 2nd, 1834) been elected a Member of the then one-year-old Entomological Society of London; his connection with the Society was, however, not of long duration. Apparently, however, he did not begin to collect regularly until 1853, from which year up to 1880 he was one of the most energetic and successful of British collectors. He found a large number of species new to the British lists, and many species that had been considered extremely rare he discovered in numbers; he seemed to have an instinctive faculty for finding localities, and an intuitive insight into the habits of the species. By his persistent and patient observation he often succeeded in taking large numbers of a beetle which another collector might have searched for in the same locality a short time before, and not found a trace of. His perseverance was only equalled by his generosity; he was always ready to give away specimens of even his rarest captures, and friends that he knew well were always at liberty to select where they liked from his abundantly filled series of insects, which he seemed to have taken and set for their especial benefit.

Dr. Power was induced by Mr. Douglas to collect *Hemiptera*, in which Order he was, as might have been expected, very successful, and he added many species to those hitherto known as British.

About five years ago he was disabled by a paralytic stroke, and went to live at Bedford. As he was unable to continue active work in entomology, he turned to gardening, and the pleasure and interest he took in his flowers was quite as keen as that which he had taken for so many years in his insects. His intellect was as bright as ever to the last, and although he had not perhaps examined particular species for years, he could tell the minute differences between them, and the very spot where, and conditions under which, he took his specimens ; in fact, he took as great an interest in entomology as ever, and the sight of an entomological friend was always welcome to him. He was apparently quite well on the night before his death, but next morning was taken suddenly ill, and soon after died ; he was buried in Bedford Cemetery on June 12th. His death leaves a gap in the ranks of British entomologists which it will be almost impossible to fill. In the words of one of his oldest friends, to whom the writer of this notice is indebted for a portion of the information contained in it: "We have had many good collectors, and some that knew more of entomological science and literature than he, but he was altogether *sui generis*, and we shall never have another Power."—W. W. F.

ENTOMOLOGICAL SOCIETY OF LONDON, *June 2nd*, 1886 : R. MCLACHLAN, Esq., F.R.S., President, in the Chair.

The following were elected Fellows, viz. :—Messrs. C. Baron Clarke, M.A., F.R.S. (formerly a Subscriber), H. Wallis Kew, of Louth, W. Dannatt, of Greenwich, J. P. Mutch, of Hornsey Road, N., Wm. Warren, of Cambridge, B. W. Neave, of Brownswood Park, N., and A. C. F. Morgan, of Oporto.

The death of Mr. F. E. Robinson, one of the Fellows, at the early age of 26, was announced. He was formerly a pupil of Prof. Westwood, at Oxford, and was killed by a tiger in India on April 27th.

Mr. S. Stevens exhibited an example of *Heydenia auromaculata*, Frey, from the Shetlands, a species new to Britain, noticed by Mr. Barrett in the Ent. Mo. Mag., vol. xxiii, p. 13, together with *H. flavimaculella*, for comparison.

Dr. Sharp exhibited certain specimens of *Staphylinidæ*, prepared by him a long time ago with a special view to their permanent preservation. They were placed in cells of cardboard, open above and below, or above only, and sealed up by successive layers of bleached shell-lac. The President said the plan appeared to be very successful where the cells remained transparent ; in other cases the preparations were open to the obvious objection that only one surface of the insect could be examined.

Mr. Billups exhibited *Meteorus luridus*, Ruthe, a species of *Ichneumonidæ* new to Britain, bred by Mr. Bignell from a larva of *Noctua brunnea*.

Mr. White, in exhibiting cocoons of *Cerura vinula*, called attention to the vexed question as to how the perfect insect escapes from these solid structures. He was inclined to think that formic acid, secreted by the insect, was a probable factor in the operation. The question also involved that of how do the parasitic *Ichneumonidæ* and *Diptera* escape ? With regard to the latter question the President remarked that larvæ infested by parasites possibly constructed their cocoons to serve the requirements of these parasites. Baron Osten-Sacken, Mr. Waterhouse, Prof. Meldola, and others, joined in the discussion.

Mr. Elisha exhibited living larvæ of *Geometra smaragdaria* from the Essex marshes. He also exhibited the singular pupæ of *Agdistis Bennetii*.

Mr. Howard Vaughan exhibited a series of several hundred bred specimens of

Peronea Hastiana, shewing the innumerable varieties, and the tendency of these varieties to connect. As they were obtained from collected larvæ it was impossible to state to what extent the variation might be hereditary. He also exhibited, on behalf of Mr. Sidney Webb, of Dover, an interesting series of *Cidaria suffumata*, with especial regard to the progeny of particular females, the parent, and the produce of the eggs laid by her being carefully separated. Mr. Vaughan also read notes on the subject communicated by Mr. Webb, and Messrs. Weir, Waterhouse, Stainton, Sharp, Distant, and others, took part in the discussion that ensued.

Mr. A. G. Butler communicated a paper on "New genera and species of Heterocerous *Lepidoptera* from the Australian region," in which 21 new genera and 103 new species were described.

Mr. J. S. Baly communicated a paper on "Uncharacterized species of *Diabrotica*." —H. Goss, *Secretary*.

THE *SCYDMÆNIDÆ* OF JAPAN.

BY D. SHARP, M.B., F.Z.S.

Twelve years ago I described, in the Transactions of the Entomological Society of London, five species of this Family. These were the first *Scydmænidæ* known from Japan, and no others have yet been added to them. I am now enabled to bring the number of species up to fifteen, all of which have been discovered by Mr. George Lewis. Nothing is yet known of the *Scydmænidæ* of China, and as the Japanese members of the Family have but little close relationship to those of Europe, it appears at present that all are peculiar to the islands. When I wrote twelve years ago the genera were not in a very well defined condition, but since then they have been greatly improved by the labours of Reitter, and *Euconnus* may be accepted as distinct, as well as *Eumicrus*, although Schaufuss (who has been one of the most extensive describers of this Family) is still of a contrary opinion as to *Euconnus*.

1. Euconnus impar, *sp. n.*

Convexus, rufescens, nitidus, thorace parum hirto, capite elytrisque nudis; antennis sub-gracilibus, clava quadriarticulata; thorace sub-oblongo, haud impresso; elytris inter suturam et humerum impressione subtile longitudinale. *Long.* $1\frac{1}{2}$ *mm.*

Joints 3—6 of antennæ slender and almost similar, 7th rather longer, longer than broad, 8th to 10th larger, sub-equal, each about as long as broad, the first of them being, however, rather more slender, terminal joint acuminate, slightly longer. Head broad, eyes small, placed quite in front; palpi elongate. Thorax longer than broad, bearing much pubescence, quite destitute of punctures or foveæ. Elytra rather narrow, slightly broader at the base than at the thorax, without humeral fold, but with a small longitudinal depression rather nearer to the suture than to the shoulder.

The male has the anterior femora much dilated, so as to form an arcuate upper margin.

Found sparingly in several localities; Yokohama, Nügata, Nagasaki, in spring and autumn.

2. EUCONNUS DULCIS, *sp. n.*

Minus convexus, rufescens, nitidus; antennis sub-gracilibus clava quadriarticulata; capite utrinque dense hirsuto; thorace sub-quadrato, basi sulcula transversa utrinque foveolata; elytris laxe pubescentibus, basin versus sub-deplanatis.
Long. vix 1½ *mm.*

Antennæ with joints 3—6 equal, 7th larger, almost intermediate in size between the 6th and 8th, so that the club is not abrupt, this consists of four sub-equal joints, each about as long as broad. Palpi with quite slender pseudo-terminal joint. Head broad, with a tuft of dense hairs on either side behind the eye. Thorax about as broad as it is long, its pubescence rather scanty, with a well-marked fovea on each side, and a finer channel between and connecting them. Elytra rather flat at the base, a little distance within the shoulder with a rather deep depression, not punctate, but with a scanty, fine, long pubescence. Tibiæ very slender. Mesosternal lamina very erect, very slender.

Nagasaki; four examples.

3. EUCONNUS DEBILIS.

Scydmænus debilis, Sharp, Tr. Ent. Soc. Lond., 1874, p. 127.

Very distinct by the three-jointed club of the antennæ. Also rare; but a single example was procured at Kioto July 4th, 1881.

4. EUCONNUS JAPONICUS.

Scydmænus japonicus, Sharp, *l. c.*, p. 127.

This is also a *Euconnus*, though peculiar, owing to the small head and the comparatively large eyes; taking, however, the structure of the anterior part of the head and the insertion of the antennæ as the criterion of the genus, and not the distance of the eyes from the neck, there can be no doubt of the systematic position of the insect. It has not been met with since Mr. Lewis' first visit.

5. EUCONNUS FUSTIGER.

Scydmænus fustiger, Sharp, *l. c.*, p. 128.

This, too, is a *Euconnus*, allied to the following; it is apparently rare, as it has been met with near Nagasaki in the spring on three occasions, each time in a single example.

6. EUCONNUS LEWISII, *sp. n.*

Angustulus, breviter, dense pubescens, fusco-rufus, elytris magis rufescentibus, antennis pedibusque testaceis, illis clava breve perabrupta, quadriarticulata; prothorace conico, haud impresso. *Long.* 1⅓ *mm.*

Antennæ short, with remarkably abrupt, broad, four-jointed club, each articulation of which is transverse. Palpi with rather broad and short pseudo-terminal joint. Head narrow and elongate, very densely pubescent, vertex much prolonged.

Thorax longer than broad, densely pubescent, sub-conical. Elytra slender, convex, much narrowed towards the base, rather densely clothed with a short fulvous pubescence, with a very slight depression within the shoulders. Pectoral lamina excessively elevated, broad.

This forms one of a little group of species characterized by the peculiar antennæ, that I think may prove peculiar to Japan, at any rate, I am not myself acquainted with any other *Euconni* having so abrupt, short and broad a club to the antennæ. *E. fustiger* is closely allied to the present species, but has a quadri-foveolate thorax, and a much larger depression at the base of the elytra.

Nagasaki; six examples found in the early spring of 1881.

I have named this species in honour of the naturalist to whom we owe so much for his entomological work in Japan.

7. EUCONNUS RAUCUS, *sp. n.*

Convexus, breviter, dense pubescens, piceus, antennis pedibusque testaceis, illis clava breve perabrupta, quadriarticulata; prothorace conico, haud impresso. *Long.* $1\frac{3}{4}$ *mm.*

This is closely allied to *E. Lewisii*, but is larger and broader, and the depression at the base of the wing-cases is larger, the humeral fold being longer and placed nearer to the outside, and there being feeble signs of two other depressions at the extreme base between this and the suture.

Nagasaki, March 26th, 1881; unique.

8. EUCONNUS OSCILLANS, *sp. n.*

Parvus, rufo-testaceus, pubescens, antennis brevibus, clava abrupta sat lata, quadriarticulata; prothorace conico-subquadrato, ante basin vage transversim depresso; elytris laxe pubescentibus, minus subtiliter punctulatis. *Long.* $1\frac{1}{4}$ *mm.*

Joints 3—7 of antennæ small, about equal, the next three joints transverse, but not strongly so, terminal joint about as long as broad. Head narrow, vertex much prolonged. Thorax without sulcus or fovea, but with an indistinct depression in front of the base. Elytra with a definite distinct punctuation, and with a scanty, rather long pubescence, only indistinctly depressed within the shoulders.

Only one example has been met with, and the description therefore is not very good, as I cannot form a good opinion as to the exact shape of the thorax, and the clothing of the head, the former being concealed by the rough pubescence, and though there is little pubescence on the head, the surface appears dull and rough as if such had been present. The species, however, is abundantly distinct, as it resembles *E. debilis*, but has a four-jointed club to the antennæ; it is different in form and appearance to the *E. Lewisii* group of species, has a much less broad antennal club, and a fine pectoral lamina.

Hitoyoshi, May 3rd, 1881; unique.

Scydmænus pollens, *sp. n.*

Convexus, longius pubescens, rufo-castaneus, antennis palpis pedibusque rufis; elytris fortiter punctatis. *Long.* 2 *mm.*

Antennæ thicker towards the extremity, the penultimate three joints very evidently transverse. Thorax small in proportion to the elytra, about as broad as long, distinctly narrowed behind, with indefinite transverse depression in front of the base, the basal portion being punctate. Elytra oval, convex, with upright pubescence, and remarkably distinct coarse punctuation, basal depressions quite indistinct.

This is allied to our *S. Godarti*, though abundantly distinct; it is larger, with the outer joints of the antennæ thicker, the punctuation of the elytra remarkable, and their basal foveæ very obscure.

Oyayama, April 26th, 1881; unique; the front femora are incrassate, so that the example is no doubt a male.

EUMICRUS.

A. Middle coxæ separated only by a sharply raised carina.

1. Eumicrus vestitus.

Sharp, Trans. Ent. Soc. Lond., 1874, p. 126.

This species is well distinguished by the remarkably large size, and the approximation of the two more inner of the basal foveæ. It has, as yet, been found only in Nipon and Kiushui; though as it is allied (but by no means closely) to the European *E. tarsatus*, we may feel sure it is to be found also in the northern parts of the Archipelago.

2. Eumicrus angustus, *sp. n.*

Angustulus, convexus, parce pubescens, rufo-brunneus, antennis pedibusque testaceis; prothorace elongato haud lato, basi foveolis quatuor parvulis sed profundis instructo: elytris obsolete punctatis. *Long.* 1¾ *mm.*

Antennæ rather elongate, with long three-jointed club, the 9th and 10th joints each quite as long as broad, the terminal joint longer. Head rather narrow, a little narrower behind. Thorax slender, longer than broad, curvate at the sides, the greatest width in front of the middle, a little narrowed behind, at the base on each side with two distinct approximate foveæ. Elytra rather narrow, convex, with short humeral fold limiting a short basal depression.

This is an ordinary *Eumicrus*, the middle coxæ being separated only by a sharply raised slender carina.

Kioto, July 4th, 1881; unique.

3. Eumicrus curtipennis, *sp. n.*

Latiusculus, sat convexus, rufo-brunneus, minus subtiliter pubescens; prothorace posterius angustato, basi utrinque obsolete bifoveolato; elytris subtiliter punctulatis. *Long.* 1⅝ *mm.*

Antennæ stout, club broad, three-jointed, 9th and 10th joints transverse, terminal not longer than broad. Head transversely sub-quadrate. Thorax rather short and broad, its greatest width very near the front, much narrowed behind, almost impunctate, the basal foveæ very obsolete, placed one near the outer angle and one just outside it. Elytra unusually short and broad, with well-marked pubescence and only a feeble punctuation.

This is intermediate between the ordinary *Eumicri* and the peculiar species forming the next group; the mesosternum is only feebly carinate, but the middle coxæ are not more distant than usual.

Ichinchi and Hitoyoshi, commencement of May, 1881; two examples.

B. Middle coxæ more largely separated, mesosternum ecarinate.

4. EUMICRUS CRIBRATUS, *sp. n.*

Sat convexus, subtiliter pubescens, pallide rufus; prothorace elongato, posterius angustato, fere impunctato; elytris crebre fortiter punctatis. *Long.* 1½ *mm.*

Antennæ rather small, club slender, three-jointed, 8th joint very small. Head transversely quadrate, not punctate. Thorax longer than broad, its greatest width much in front of the middle, strongly narrowed towards the front and much narrowed behind, without impressions. Elytra rather coarsely and closely punctate.

Allied to *E. reversus*, but readily distinguished by the nearly impunctate thorax.

Sapporo, Kashiwagi, June 15th, 1881; five examples.

5. EUMICRUS REVERSUS.

Scydmænus reversus, Sharp, Tr. Ent. Soc. Lond., 1874, p. 128.

Mr. Lewis has now found a small series of this remarkable little insect; the peculiar pygidial structure described by me (*l. c.*) proves to be peculiar to the male sex, the pygidium in the female being normal. The structural characters previously given by me are mostly such as are now recognised as characteristic of *Eumicrus*, the mesosternal structure is, however, not that normal in the genus mentioned, but it would be superfluous to institute a new genus on this account at present.

Found in thatch at Ipongi, March 31st, 1881; at present only taken in the Nagasaki district.

CEPHENNIUM JAPONICUM, *sp. n.*

Rufo-piceum, longius minus subtiliter pubescens, antennarum clava crassa, haud abrupta, triarticulata. ***Long.* 1⅓ *mm.***

Joints 3—7 of the antennæ are small, the 8th very evidently larger, the club is large and increases in width to the terminal joint. Thorax strongly transverse, as broad as elytra, the sides behind with a slightly elevated broad margin, the surface is finely punctate, and there is a fovea near each hind angle. The elytra are roughly pubescent and punctate, and there is an elongate, very fine, humeral plica. The middle coxæ are very distinctly separated.

Nagasaki; four examples.

Southampton: *March*, 1886.

NOTES TOWARDS THE LIFE-HISTORY OF *SCENOPINUS FENESTRALIS*.

BY C. R. OSTEN-SACKEN, HON. F.E.S.

[The "Canadian Entomologist" for April, 1886, contains a short article by Dr. Hagen: "The probable food of the larva of *Scenopinus*," which records an observation of Prof. Putnam, who found this larva under a carpet, near an empty case of a clothes-moth. Dr. Hagen asks himself whether the larva of *Scenopinus* does not destroy that of the clothes-moth, in which case it would prove a very beneficial insect.

Several years ago I had prepared an article on the same subject, which remained, however, among my unpublished manuscripts. As I arrived at the same conclusion as Dr. Hagen, and as the literature on the subject is a little more developed in my article, than in his, I deem it worth while to publish it here.]

I have often wondered what the history of that demure little fly could be which keeps so steadily to our windows: Schiner (Fauna Austr., I, p. 159) observed that although the windows stood open for hours every day, specimens of *Scenopinus* would remain on them and die on the window-sill. That the views on the habits hitherto entertained are not correct, I take for certain. Bouché (Naturg., etc., p. 46) found the larva in decaying tree-fungi. Dufour (Ann. Soc. Entom., 1849) found only the pupa, of which he gives a figure. Haliday, on the strength of these observations, called the larva saprophagous (Halid., on certain rem. blanks, &c.). Asmuss (Stett. Ent. Zeit., 1863, p. 401) found it in ripe strawberries, and describes the pupa as enclosed in *a light cocoon*, a statement which renders the observation doubtful. Frauenfeld (Verh. Zool. Bot. Ges., 1863, p. 65) criticises these statements, and gives a detailed description of larva and pupa; the larva was found among horse-hair in a mattress, and was brought to maturity by being kept among horse-hair, which Frauenfeld, for this reason, takes to be its food. Loew (Verh. Zool. Bot. Ges., 1861, p. 395) found the larva in a swallow's nest, and took it for that of *Thereva*, a statement which Frauenfeld, *l. c.*, corrects, no doubt, with good reason. Damianitch (Verh. Zool. Bot. Ges., 1865, p. 237) found a cocoon of *Saturnia pyri*, inside of which, among remains of the pupa, he discovered a chrysalis; he bred *Scenopinus niger* from it; he gives a good figure of the chrysalis, which, he says, agrees in the main with the figure previously given by L. Dufour of the chrysalis of *Sc. fenestralis* (the differences are probably specific). Packard (Proc. Essex Institute, 1867, p. 93) gives a rough figure of the larva, which, he says, was found feeding on carpets. V. Heyden bred *S. niger* from dry, rotten wood (Jaennicke, Berl. Ent. Zeit., 1867, p. 78). Perris (Insectes du pin maritime, Diptères; Ann. Soc. Ent., 1870, p. 226) found larvæ and pupæ in a branch of *Cratægus*, which contained larvæ of *Ptinus germanus*, and in pine boards, containing larvæ of *Hylotrupes bajulus*; he observed a larva of *Scenopinus* devouring a chrysalis of *Hylotrupes*; he also quotes an observation of Dr. Cartereau, who found in a swallow's nest a pupa of *Lucilia dispar*, containing the imago of a *Scenopinus*, which had died in the effort of escaping from it; Perris concludes by saying, that "this larva, like that of *Thereva*, feeds on animal substances, that is animal dejections or exuviæ, and that it is even carnivorous." Mr. C. O. Waterhouse exhibited at the Entomological Society a *Sc. fenestralis* bred from the root of *Aconitum* (Proc. Ent. Soc. Lond., December 7th, 1881; Ent. Mo. Mag., January, 1882).

It seems to me that Perris might have stated more boldly that the larvæ of *Scenopinus*, like that of *Thereva*, *is* carnivorous. This is the result which I obtain from the comparison of all the previous observations. The larva does not frequent fungi, rotten wood, swallows' nests, &c., for the sake of vegetable matters, or animal remains, but for the sake of the pupæ, and, perhaps, also of the larvæ, which it finds there. And I deduce from this that when it occurs in carpets and horse-hair it is not because it feeds on them, but because it hunts there for the larvæ or pupæ of the moths or other insects that live in them.

The long, serpentiform, white larva, very hard to the touch, and very tenacious of life, has several times been brought to me, but it did not occur to me at that time to feed it on larvæ or chrysalides of moths. It might be worth while to try the experiment, and thus to prove that the demure little fly is, after all, a useful member of our household.

Heidelberg: *July*, **1886**.

CAPTURE OF *EUCNEMIS CAPUCINUS*, AHRENS, A GENUS AND SPECIES NEW TO THE BRITISH LIST.

BY H. S. GORHAM, F.Z.S.

On Wednesday, July 7th, at the meeting of the Entomological Society, specimens of *Eucnemis capucinus*, a beetle new to the British Fauna, of more than usual interest, were exhibited by me, and some remarks upon the capture, and on the larva of the species were read by Dr. Sharp. A short notice of this addition to our collections will perhaps be interesting to your readers. The insect was discovered in the wood of a partially decayed beech-tree near Brockenhurst, by Dr. Sharp, Mr. G. C. Champion, and myself on the 12th of June, at which time they were apparently freshly emerging from the pupa, some of the beetles being found in the latter state with a very few larvæ. They had formed a colony which had endured for many years, the dead remains of former generations being there.

The family *Eucnemidæ* to which the genus belongs is a remarkable one, of which *Eucnemis* is a typical member, *Microrhagus* and *Melasis*, the other two genera comprised in our list, being aberrant. With the general appearance of a small black *Elater*, *Eucnemis capucinus*, Ahrens, combines several of the characters of the *Throscidæ*. Among the more remarkable of these may be noticed the broad serrate antennæ which are received into grooves on each side of the thorax; the very retractile structure of the legs, and especially of the hind legs, the femora and tibiæ of which in repose are quite concealed by the coxæ; the silky smooth surface of the under-side of the body; and, above all, the depressed and reflexed front of the head, which is carinate, and of which the epistome, or portion immediately above the mouth, meets the anterior margin of the prosternum, completely closing and covering the mouth and its organs. Dr. Sharp ascertained that the insect possesses the power of springing, when turned on its back, to a considerable degree; one brought home alive, which he showed me, thus sprung at least an inch high.

Eucnemis capucinus is not uncommon on the continent of Europe, and considering that we found it in some numbers, it seems only remarkable that it had hitherto escaped the vigilant search of the numerous Coleopterists who, since Stephens' days, have visited the New Forest. We have secured enough specimens to supply most of the collections with a representative. Is it too much to hope that "*requiescat in pace*" may be allowed to be the epitaph over what remain till the returning season has given time for a fresh brood to be matured?

Shirley Warren, Southampton:
July, 1886.

TROPICAL AFRICAN *COLEOPTERA*; CHIEFLY FROM THE ZANZIBAR MAINLAND.

BY H. W. BATES, F.R.S., &c.

(*Continued from page* 13).

Sub-fam. *OODINÆ*.

SPHÆROODES IMPUNCTATUS, sp. n.—S. striato, Dej., Chaud., *simillimus sed differt striis simplicibus, etc. Ovatus, convexus, niger politus thorace castaneo, palpis melleo-flavis, antennarum articulis* 1—3 *pedibusque testaceo-rufis: thorace margine basali late arcuato angulis posticis acutis, toto lævi: elytris acute striatis interstitiis planis, stria* 1^{ma} *et* 2^{nda} *basi conjunctis ibique absque foveola, striola scutellari haud impressa seriatim punctulata.*

Long., 8 *mm.*, ♂.

Ribé, near Mombas (*Mr. Wakefield*).

Differs from the only other described species in the sharply-incised and fine impunctate striæ, the absence of an umbilicated puncture at the junction (at the basal fold) of the 1st and 2nd striæ and in colour; the thorax being dark reddish-castaneous, and the palpi and legs pale: the under-side of the body is more or less reddish-piceous.

Sub-fam. *ANCHOMENINÆ*.

MEGALONYCHUS SCULPTILIS, sp. n.—M. rugicolli, Laferté, *affinis. Robustus, niger nitidus, palpis antennis et tarsis testaceo-rufis; capite lævi: thorace magno, orbiculari sed postice magis quam antice angustato, angulis posticis nullis, medio basi sinuato, disco discrete, lateribus rugoso-punctatis; elytris prope apicem profunde et longe sinuatis, angulo suturali obtuso, profunde striatis vel sulcatis striis crebre punctatis interstitiis vix convexis* 3^{io} *tri-vel quadrifoveolato* 7—9 *confuse punctatis.* *Long.*, 15 *mm.*, ♂.

Mpwapwa (*Mr. Last*).

MEGALONYCHUS EXCISUS, sp. n.—M. rugicolli, Laf., *affinis. Niger*, ♂, *nitidus*, ♀, *opaca, antennis basi palpis pedibusque obscure rufo-piceis: thorace magno late ovato angulis posticis nullis, disco fere lævi lateribus rugoso punctatis explanato-reflexis: elytris elongato-oblongo-ovatis apice profunde parum oblique sinuatis, angulo suturali rotundato, striis acute incisis crebre punctulatis, interstitiis planis* 3^{io} *tripunctato, exterioribus et margine explanato punctulatis.* *Long.*, 14 *mm.*, ♂ ♀.

Mamboia (*Mr. Last*).

This and the preceding species are of more elongate form, with the elytra relatively longer, than *M. rugicollis*, Laferté, and the sutural apex is destitute of the tooth-like prominence which distinguishes *M. rugicollis*. The outline of the thorax is very similar, and the base of the elytra is arcuated on each side with obtuse humeral angles.

The sides of the sternal plates and basal ventral segments are more or less coarsely punctured. *M. obscurus*, Chaudoir, which belongs to the same sub-group of the genus, is distinguished by the black basal joints of the antennæ, and a puncture at the apex of the first elytral interstice; *M. platyderus* (another allied species) by the truncated base of the elytra and the hind angles of the thorax indicated by an obtuse dentiform prominence. Both *M. sculptilis* and *M. excisus* are distinguished by the remarkably deep sub-apical sinuation of the elytra, the anterior angle of the sinuation, though rounded, being prominent and conspicuous, and also by the large circular, sometimes umbilicated, punctures of the third elytral interstice.

MEGALONYCHUS SWAHILIUS, sp. n.—M. rugicolli *affinis, sed multo gracilior: piceo-niger, palpis antennis basi pedibusque piceo-fulvis (trochanteribus pallidioribus): thorace angustiori et postice magis angustato angulis posticis obtusissimis sed distinctis margineque ante angulum leviter sinuato, punctato-rugoso disco fere lævi: elytris sat anguste oblongis, apice oblique et mediocriter sinuatis, angulo suturali haud dentato, margine basali utrinque angulatim sinuato, striis acute incisis crebre crenato-punctulatis, interstitiis fere planis, subtiliter alutaceis* (♂) *sed sericeo-nitidis,* 3^{io} *bipunctato: prosterno lævi meso- et metasternis extus disperse punctulatis.* *Long.*, 11 *mm.*, ♂.

Mamboia (*Mr. Last*).

Sub-fam. *PTEROSTICHINÆ.*

ABACETUS WAKEFIELDI, sp. n.—Ad. Sect., I, 2, A, b, Chaud. Monogr., *pertinet. Magnus, piceo-niger nitidus; thorace impunctato subrotundato antice et postice fere æqualiter angustato, margine laterali incrassato valde reflexo intus sulco marginato, sulcis basalibus profundis; elytris oblongis simpliciter sat profunde striatis interstitiis parum convexis; corpore subtus impunctato.* *Long.*, 15 *mm.*, ♂ ♀.

Ribé, near Mombasa (*Mr. Wakefield*).

The sub-group of Chaudoir's Monograph of *Abacetus*, to which this species belongs, contains those species in which the four hinder tarsi are pluri-sulcate, the front tibial spurs and male fore femora simple, and the thorax rounded on the sides. In the present species the sides of the thorax describe an arc, from the anterior to the posterior angles, but the latter are distinct though obtuse. In its widest part the thorax is scarcely narrower than the elytra, and its lateral margins form a rim which becomes broader as it approaches the hind angles, and is separated from the disc of the thorax by a broad groove (not widened near the base), separated from the disc by a faint fold, which is continued, at an angle, along the base of the thorax on each side as far as the basal sulci. In this peculiar sculpture of the thorax the species resembles *A. loricatus*, from Guinea, which, according to Laferté's description, differs from ours in its duller surface and punctate-striate elytra.

ABACETUS CAMERONUS, sp. n.—Ad. Sect., I, 2, A, c., Chaud. Monogr., *pertinet: latus, niger nitidus, palpis antennis et pedibus piceo-rufis: thorace transverso medio dilatato, antice subrecte, postice sinuatim, angustato, angulis anticis prominentibus acutis, posticis fere rectis, margine laterali postice incrassato a disco sulco angusto separato: elytris relative brevibus, basi utrinque arcuatis, convexis profunde et acute striatis striis lævissimis: corpore subtus lævi, episternis posticis brevissimis.* *Long.*, 12—14 *mm.*, ♂ ♀.

Mount Cameroons.

A handsome species; allied to *A. grandis*, but very different in the proportions of the elytra to the thorax, and distinguished further by its glossy surface and red legs. The elytra are only twice the length of the thorax, and are rounded on the sides and narrowed behind gradually to the apex. The hind angles of the thorax are almost obtuse-angled; the anterior angles are remarkably acute and produced.

ABACETUS LEISTOÏDES.—A. camerono *affinis sed facies valde diversa. Elongato-oblongus, niger nitidus, palpis antennis pedibusque obscure piceo-rufis: thorace transverso quadrato-cordato, angulis posticis rectis, margine laterali postice haud incrassato, intus a disco sulco angusto et profundo separato: elytris elongato-ovatis profunde simpliciter striatis: sternis impunctatis.* *Long.*, 11 *mm.*, ♂ ♀.

Gaboon.

Belongs to the same sub-group as *A. cameronus*, but of the ordinary elongate oblong form of the *Abaceti*, and somewhat resembling *A. atratus.* The lateral marginal rim of the thorax is thickened, but not dilated posteriorly, and its accompanying groove is equally uniform in width, and unusually deeply incised. The thorax is impunctate, much broader than long, broadly rounded before the middle, and rather strongly narrowed and sinuated to the base, the posterior angles being rectangular and sometimes prominent. The metathoracic episterna are a little broader than long.

ABACETUS NYASSÆ.—Ad. Sect., I, 2, A, c, Chaud. Monogr., *pertinet: angustus, niger nitidus, palpis, antennis articulo primo tarsisque rufo-piceis: thorace rotundato-quadrato, lateribus arcuatis mox ante angulos posticos sinuatis, margine haud incrassato sulco haud profundo a disco separato, medio basi rugoso-punctato: elytris anguste oblongis, acute striatis interstitiis planis prope apicem convexis.* *Long.*, 9 *mm.*

Lake Nyassa (*Mr. Cotterill*).

A small narrow species resembling an *Argutor*. The thorax is broader than long, with rounded sides, sinuated only just before the slightly projecting hind angles. The lateral rim of the thorax is not at all thickened, and its accompanying groove is of equal width throughout, and delimited from the disc by a fine fold. The posterior episterna are decidedly longer than broad.

(*To be continued*).

ENTOMOLOGICAL LOCALITIES NEAR LIVERPOOL.

BY JOHN W. ELLIS, L.R.C.P., F.E.S.

Some of the readers of the Ent. Mo. Mag. will, doubtless for the first time, be visiting Liverpool during the ensuing two months, attracted thither by the Liverpool Exhibition, and in the interest of such strangers to the neighbourhood the following notes have been penned as a "guide" to those localites within a moderate distance of the city which are of interest to the practical entomologist.

The geological formation upon which the city of Liverpool and its immediate neighbourhood, both in Lancashire and Cheshire, rests, is that of the trias or new red sandstone, the characters of which are well shown in the cuttings leading to the Lime Street and central railway stations, but above this rock there exists throughout the greater portion of the district a layer, variable in depth, of cold, tenacious, boulder clay, containing glacier-grooved stones and many species of sea-shells almost, if not quite, identical with those at present living in the Irish sea. As may be expected from a geological formation so unproductive of peculiar forms of plants, the insects of the district are not of a very striking character, except where the surface of the country has undergone some departure from the ordinary condition, such as has occurred in three distinct forms, viz: the tract of sand-hills which stretches from the Ribble to the Mersey (Lancashire), and, again, from the Mersey to the Dee (Cheshire); the elevated ground in that portion of Cheshire which lies between the rivers Mersey and Dee, where the sandstone appears at the surface, without any clay covering, and where the prevailing plants are the heaths and gorse, such localities as Bidston and Prenton Hills; and, thirdly, the tracts of moss-land, fast alas! disappearing through cultivation, parts of the original Chat moss over which the railway is carried between Manchester and Liverpool. These localities may now be treated seriatim, only those insects being noticed which are of special interest.

Lancashire coast sandhills.—These may be easily reached from the Liverpool exchange station (L. and Y. Railway). Perhaps the best place to go to is Hall Road, though there are not many trains that stop at this roadside station. Here the sandhills come directly up to the station, while at Crosby, the preceding station, which offers the advantages of trains back to town nearly every half hour, houses are growing so rapidly that one has a quarter of an hour's walk before one can commence collecting. No directions are needed for finding the way from either place, except that the railway line should not be crossed, that is, the sea side of the line only should be worked.

By rambling about up the hillocks of sand (held together by the "marram" or "star-grass," for destroying which there is provided a penalty), and searching among the low growth of dwarf sallow, &c., in the intervening hollows, many beetles and representatives of other Orders of insects may be found, which are not of general distribution. Wherever there is an overhanging bank formed by the matted roots of the star-grass, this should be shaken pretty roughly, and nocturnal *Lepidoptera* of various species will be shaken out, and will lie—except the day be very sunny—quite still, waiting to be boxed. Such species as *Mamestra albicolon* (June and July), *Agrotis tritici* and *aquilina* (August), *Agrotis cursoria* (August), *Agrotis præcox* (August), may be obtained in this way, often in abundance, while, if the ragwort flowers be examined after dark with a lantern, they will often be found *swarming* with the same species of *Agrotis*, to which may be added *Agrotis nigricans*, often nearly black, *Leucania conigera*, *Hydræcia nictitans*, *Cidaria testata*, and several species of *Eupithecia*. The larva of *Cerura vinula* may frequently be found about the beginning of August on the small willows which grow in the neighbourhood, while those of *Orgyia fascelina* and *Bombyx trifolii* used to be abundant on the willow and star-grass respectively in May and June, but are fast becoming exterminated by the cupidity of collectors for exchange. In August, too, the plants of ragwort, especially towards Hightown, the next station beyond Hall Road, are often eaten to the root, stalks and all, by the beautiful caterpillars of *Euchelia jacobææ*; while a little earlier, say in July, on the thistles growing on the bare sandhills—bare but for the star-grass—the larvæ of the painted-lady butterfly (*Pyrameis cardui*) may at times be taken in scores: the butterfly appearing in August. Among the *Coleoptera* the species sure to be met with are: *Cicindela hybrida*, on the *barest* sandhills, but only on hot sunny days; *Dyschirius impunctipennis*, often abundant on sunny days on the shore near high-water mark; *Cillenus lateralis*, frequent on the shore towards Hightown, but only to be found where there is clay; *Bembidium biguttatum*, *B. æneum*, *B. minimum*, *B. bipunctatum*, *B. concinnum*, and *B. lunatum*, all common beneath rejectamenta, and beneath seaweed, especially about the mouth of the Alt, a small river which flows into the sea at Hightown; *B. pallidipenne*, abundant, especially clinging to the under-sides of *small* pieces of wood and bark on the shore at about high-water mark; *Calathus flavipes* and *C. mollis*, both abundant under rubbish, and at roots of grass on the sandhills; *Broscus cephalotes*, common under drift-wood on the shore above high-water mark, frequently forming a burrow a couple of inches deep; *Dichirotrichus pubescens*, abundant under rejectamenta on the shore near Hightown; many local species of *Staphylinidæ* on the shore; *Sarrotrium clavicorne*, occasionally found crawling up the *bare* sandhills (it never seems to get to the top); *Saprinus æneus* and *nitidulus*, abundant, and *maritimus* and *quadristriatus*, less frequent, in dung and carrion; *Parnus auriculatus*, often in thousands on the bare sandhills, and occasionally *Heterocerus marginatus* may be found where the shore is muddy. Among the *Lamellicornia*, *Onthophagus fracticornis* is abundant, burrowing beneath dung, while many species of *Aphodius* occur abundantly in spring, such as *A. subterraneus*, *granarius*, *plagiatus*, *inquinatus*, *pusillus*, &c., while on rare occasions *melanostictus*, *villosus*, and *porcatus* have occurred. *Psammobius sulcicollis* is frequent, and *Ægialia arenaria*, abundant, the latter principally on the barest sandhills. *Anomala Frischii* is frequently common on the wing, and at rest on the star-grass on the higher sandhills, especially near the shore, but is only found on hot, sunny days; and *Oxythyrea stictica has* occurred in the flowers of *Rosa spinosissima* in June. *Limonius cylindricus* is common, both crawling on the sandhills and on the dwarf sallow, from which it can be obtained by sweeping. *Zeugophora subspinosa* is abundant on poplars, along with *Phratora vitellinæ*—the latter on willows as well; the plants of ragwort usually swarm with *Thyamis tabida;* *Crepidodera transversa* is frequent on herbage growing by the river Alt; and *Sphæroderma cardui* is often common about the thistles, where *Pyrameis cardui* larvæ are feeding. Among the *Heteromera*, *Heliopathes gibbus* and *Microzoum tibiale* are abundant on the bare sandhills; *Cistela murina* is common on all sorts of plants; *Lagria hirta* is frequently swept from the sallows, &c.; *Anthicus bimaculatus* has occurred a few times; *Notoxus monoceros* is common, crawling on the sandhills. The *Rhynchophora* are not largely represented at Crosby, but *Cneorhinus geminatus* is swarming on the bare sandhills in spring, and again occurs in autumn; *Polydrusus cervinus* and *Phyllobius oblongus* are common on sallows; *Otiorrhynchus ovatus* is frequent, and *Sitones griseus* abundant on the bare sand; *Cleonus sulcirostris*, abundant about thistles; *Hypera*, several species; *Erirhinus bimaculatus* (occasional), and *E. acridulus* (frequent), under rejectamenta at Hightown.

Wallasey sandhills, on the Cheshire coast, are, perhaps, the most frequently visited of all our entomological localities. These sandhills, which differ considerably in the character of their vegetation from those on the opposite side of Liverpool Bay, may be reached either from New Brighton or from Seacombe, for both of which places there are boats leaving the landing stage at intervals of not more than every half hour. If the boat be taken to New Brighton, the shore must be followed for about a mile, until beyond the yellow and red sandstone cliffs, locally yclept the "Yellow" and "Red Noses," on the distal side of which the sandhills commence, though for the nearest half-mile they are so bare that, except for a few species of *Coleoptera*, they scarcely repay working. If Seacombe be selected as the starting point the tram-car should be taken from Seacombe Ferry as far as Liscard Village (the end of the 2d. fare), and the road immediately opposite where the tram stops (Wallasey Road) being followed will lead the traveller directly through Wallasey village on to the sandhills in their best parts. The distance from Liscard Village is about two miles, rather under than over, and in following the road either the fork may be taken which *rises up to* Wallasey Church, and which eventually leads past the Claremont Schools, across a piece of waste ground and down the lane opposite a row of cottages on to the sandhills, or the main road which *descends* just before reaching the Church, and then turns to the right to form the main street of the village. The former road offers a little better collecting for the Lepidopterist, by beating the hedges, than the latter.

Arrived on the sandhills, the Lepidopterist need have nothing to complain of, nor need the Coleopterist, nor would the student of any other Order of insects go away without many species of interest, providing the weather be suitable. Among the Diurnal *Lepidoptera*, the only butterfly not of universal distribution, which haunts this district, is the "Grayling" (*Satyrus Semele*), and during August this is abundant, and it is most interesting to notice how the species has a habit of settling on the bare sand, where it is not easily observed, owing to the harmony between the speckled pattern of the under-sides of the wings, and the surface on which it rests. During August and September, by examining the tufts of yellow bed-straw (*Galium verum*) the larvæ of *Chærocampa porcellus* and *Macroglossa stellatarum* may be found, and that of *Deilephila galii* may be looked for at the same time, for it once occurred in abundance here (in 1870), but has not been met with since. On the same tufts may probably be found the larvæ of *Melanippe galiata* and *Eubolia lineolata*, both of which species are common on the sandhills, just beyond Wallasey Village. The larvæ of *Arctia fuliginosa* may be found throughout the autumn on low plants, and those of *Bombyx rubi* among the tangled grass, and *Rosa spinosissima*, but both these species hibernate, and are difficult to get through the winter, though, by adopting Mr. Robson's plan—or, at any rate, the one recommended by him,—of enclosing a single full-fed larva of the "fox" moth in a chip-box, and leaving it for a few weeks in the fender by the kitchen fire, they may often be got to form their cocoons, and to emerge early in the following year. By shaking the herbage hanging from the sandy banks, *Mamestra albicolon*, *Leucania littoralis*, *Heliothis peltigera* (occasionally), and many other species of *Noctuæ* may be obtained in good condition; while, by examining the ragwort flowers with a lantern, *Agrotis valligera*, *tritici*, *aquilina*, *cursoria*, *nigricans*, and *præcox*, *Hydræcia nictitans*, &c., may be taken in abundance on favourable nights in August and September, while at the same time there is a chance of *Sterrha sacraria* on the same flowers, for it has occurred here a few times. Several of the above-mentioned *Noctuæ*, *Agrotis valligera* especially, may be seen during the day-time, even in the hot sunshine, on the ragwort flowers, but they fall off at the slightest alarm. The Wallasey sandhills, as everybody knows, are the home of at least three species of Lepidopterous insects, which scarcely, if at all, occur elsewhere, viz.: *Nyssia zonaria*, though this has spread itself, and been transplanted for some distance along the coast; *Rhodaria sanguinalis*; and *Peronea permutana*. *N. zonaria* occurs in the imago condition during April and May, the males being very conspicuous as they sit on the bare sticks of last year's willows, or on tufts of grass. The larva feeds principally on sallow (very rarely on yarrow, if it can get anything else) during June and July, and is also very conspicuous. *R. sanguinalis* is confined to those portions of the sandhills where thyme grows—just beyond Wallasey Village, near the small plantations, is a good place for it, and it flies about 6 p.m. during fine days in June. *P. permutana* occurs in August among *Rosa spinosissima,* and the best place for it is among the tangled grass and rose growing about a mile N.W. of where the sandhills are entered from Wallasey Village. It flies during the early evening, but may be smoked out in the day time. During September, the larvæ of several of the *Eupithecia* may be found on the flowers of the ragwort, notably those of *E. centaureata*, *E. virgaureata,* and *E. absynthiata,* while on the ragwort growing in the gardens on the edges of the sandhills may be found the larva of *E. succentaureata,* and that of *E. linariata* in the unripe fruit of toad-flax growing in similar places. Many rare species of *Tineina,* of which, however, I know little, occur on these sandhills, especially members of the genus *Gelechia.*

Turning to the *Coleoptera,* we notice a great similarity to those mentioned as occurring on the opposite side of the river, but there are species here which do not occur there, and *vice versa.* *Elaphrus cupreus* and *riparius* are common on the edges of the "flashes" of water in the hollows between some of the sandhills; *Notiophilus aquaticus*, and, occasionally, *substriatus*, may be found in similar localities, together with *Anchomenus marginatus.* *Dyschirius globosus* is sometimes abundant in damp hollows, and *Aphodius plagiatus* has a habit of frequenting like situations, completely burying itself in the sand. Some of the deeper collections of water swarm with the commoner *Dytiscidæ*, but among these may occasionally be found *Dytiscus punctulatus.* *Coccinella mutabilis* is often abundant in the late summer months, crawling everywhere, while *Aphodii* revel in the dung of the New Brighton donkeys. Out of the thirty-nine species of *Aphodius* recognised as British, I have taken at least twenty-two species in this locality. *Agelastica halensis* is sometimes abundant in autumn, seeming to have a partiality for the yellow bedstraw. *Grypidius equiseti* is frequently found crawling on the bare sandhills, *Hypera nigrirostris* is usually abundant; *Orchestes salicis* and *Rhamphus flavicornis* are abundant during the summer, and may be taken in the sweeping-net; while several species of the genus *Apion* seem to be always abundant. These sandhills, too, are the haunt, among bees, of *Colletes cunicularia,* found, I believe, nowhere else.

Bidston Hill may be reached most easily from Birkenhead. Arrived at Birkenhead Ferry take the "Docks Station" tram-car, ask the conductor to set you down at the nearest place for Bidston Hill, from which you have a quarter of an hour's walk before reaching your destination. The conductor will point out the road.

Here, among the heather and gorse, the Lepidopterist will meet with, in July, *Lycæna Ægon* in abundance, but local, the best place for it being among the gorse between the windmill and observatory, but nearer the eastern (or Birkenhead) side of the hill. In August, *Satyrus Semele* is abundant near the old mill, while early in

June the gorse swarms with *Eubolia palumbaria*, though difficult to obtain in good condition. On the heather may be found in late autumn and early spring the beautiful larva of *Agrotis porphyrea*, and the perfect insect may occasionally be taken during the summer on the wing. The plantations on the west slope of the hill produce, by beating the birch during September, the larvæ of *Notodonta dromedarius*, *Lophopteryx camelina*, and *Amphidasis betularia*, though the perfect insects of these species are seldom seen in the neighbourhood. The fir plantation on the east slope produces *Trachea piniperda*, *Eupithecia indigata*, and *Fidonia piniaria*, besides other species. Although "smoking is not allowed on the hill," some of the Liverpool collectors manage, in defiance of the notices, to take by smoking the gorse bushes during early spring, *Peronea mixtana* and *Depressaria umbellana* in abundance. The *Coleoptera* of Bidston Hill are not numerous. *Cymindis vaporariorum* has occurred once, when I took two specimens, in October; *Bembidium lampros*, var. *velox*, occurs sparingly, and *Bembidium nigricorne* rarely. Among the dead leaves of heath may be found in September, and throughout the winter, *Bradycellus harpalinus* and *B. similis* in abundance, and *Dromius nigriventris* occasionally. On the heather, nearly all the year round, *Adimonia suturalis* is as abundant as it is variable. *Carabus catenulatus* is occasionally met with about the hill, under stones, and *Hylobius abietis* has attacked several of the firs in the plantations—on which latter trees, too, *Coccinella oblongo-guttata* and *C.* 18-*guttata* are common in spring. *Diptera* are very numerous, especially in the plantations, though I have never stayed to ascertain the species, being glad to get away from them as soon as possible.

Simmonswood Moss is a splendid locality for insects, but is, unfortunately, fast disappearing under cultivation. It would be oftener visited by entomologists were it not for two reasons, viz., the long distance from the nearest station, and, secondly, the close preservation of game for the Earl of Sefton. To get to Simmonswood it is necessary to take the train from the Exchange Station to Kirkby (pronounced Kirby); leaving the station, turn to the left across the railway bridge, again to the left a few yards further on, and keep the main road, which at a distance of about four miles terminates on the "moss."

Here, in June, *Chortobius Davus* is abundant; in September the small birches produce by beating, plenty of larvæ, including: *Notodonta dromedarius*, *Lophopteryx camelina*, *Leiocampa dictæoides*, *Acronycta leporina*, *Amphidasis betularia*, *Platypteryx falcula*, &c., &c. At the same time, by searching *under the plants* of heather, *Hydræcia nictitans* and *Celæna Haworthii* may be found in plenty; the larvæ of *Saturnia carpini* are tolerably common, but a little sooner in the year, on the flowers of the heath, the imagines being abundant in May, when I have known over 200 males to be taken in a single afternoon with a freshly emerged female. The moss produces some good beetles, such as; *Carabus nitens* (rarely), *Anchomenus ericeti*, *Elater balteatus* (in June), *Cryptocephalus bipustulatus* (rarely), *Coccinella hieroglyphica*, &c., &c.

These are the more important of the entomological localities in this district, others there are which can scarcely find a place in such a sketch of the district as has been given above. In conclusion, I may mention the splendid collections of British *Lepidoptera*, and of European *Rhopalocera*, made by the late Nicholas Cooke: the British collection containing, in addition to his own, that of the late Noah Greening, of Warrington, and a selection from that of the late Edwin Birchall, of the Isle of Man. These collections were bequeathed by Mr. Cooke to the citizens of Liverpool, and are deposited in the Liverpool Museum, where, though far from being completely arranged, for their donor died while engaged in the enormous task of re-arranging the entire collection, they may be seen by any one interested on application to our courteous curator, Mr. Thomas J. Moore.

3, Brougham Terrace, Liverpool:
July 10*th*, 1886.

NOTES ON THE GENERA *CÆROSTERNUS* AND *IDOLIA* (*HISTERIDÆ*).

BY GEORGE LEWIS, F.L.S.

In 1852, Leconte established the genus *Cærosternus* in the Proc. Acad. Phil., vi, p. 39, for the reception of two insects, *C. americanus* and *lævissimus*, but it is impossible to retain these two species in the same genus, nor should they at any time have been placed together. The antenna of *C. americanus* has a solid club, and in *C. lævissimus* the club is clearly 3-articulate, while the exoskeleton of the first is essentially different from that of the second in form and sculpture. I propose, therefore, to retain Leconte's genus *Cærosternus* for the first-named species *americanus*, with this special emendation, that the club of the antenna is solid.

In 1885 I formed the genus *Idolia* (Ann. Mag. Nat. Hist., p. 214) to receive two insects, one, *punctisternum*, from Blumenau, S. Brazil, the other, *lævigata*, from Honduras, and I find now that both of these are congeneric with *C. lævissimus*, Leconte, but what the specific differences may be I cannot say. At present, it is well to consider Leconte's "*lævissimus*" as undescribed, for all he says regarding it applies to four or five species of *Idolia* which are now before me. This is Leconte's description:—"*C. lævissimus*: upper surface very smooth and shining, the epipleuræ less suddenly inflexed than in *C. americanus*, with only two very fine lateral striæ; the dorsal striæ of the elytra obsolete. The body is narrower and more elevated than in the preceding" (*americanus*).

In 1811, Paykull published a description of *Hister lævigatus*, which Marseul, in his Monograph, 1855, considers to be the same species as Leconte's *lævissimus*, for until recently it was assumed by authors that there was only one species of this curious form in the family, while now my opinion is that species allied to it are numerous in Central America.

When I wrote my description of *Idolia lævigata* I considered *Hister lævigatus*, Paykull, a true *Tribalus*; as, however, it is an *Idolia*, I suggest the name of *gibba* for my species, Paykull's name having the priority of 75 years.

The members of the genus *Idolia* are difficult to characterize, as the general structure in all is very much the same, and the specific differences are few, and such as require the microscope to reveal them. The localities given by Marseul for *Tribalus lævigatus* are United States, New Granada, Yucatan, Venezuela, Cuba, and St. Domingo; but I think it probable that specimens of *Idolia* from these places on close examination will prove, in some instances, to be specifically distinct. Crotch did not include *Tribalus lævigatus* in his Catalogue of the *Coleoptera* of the United States, and it is probable this locality has been recorded in error, as Dr. Horn has stated in his Synopsis.

A list of the names and synonyms of the four species may read as under:—

CÆROSTERNUS AMERICANUS, Leconte, 1852.
  Tribalus americanus, Leconte, 1845.
  Tribalus americanus, Marseul, 1855.
  Tribalus marginifer, Marseul, 1862.
IDOLIA LÆVIGATA, Paykull (*Hister*), 1811.
  ? *Cærosternus lævissimus*, Leconte, 1852 (undescribed).
IDOLIA GIBBA, Lewis, 1886.
  lævigata, Lewis, 1885.
IDOLIA PUNCTISTERNUM, Lewis, 1885.

There are two species more to be added shortly from the Godman collection.

Wimbledon: *June*, 1886.

DESCRIPTION OF A NEW GENUS AND SPECIES OF *HEMIPTERA-HETEROPTERA*.

BY JOHN SCOTT.

On turning over the leaves of one of the back volumes of the Entomologist's Monthly Magazine, in search of some information which I wanted, I stumbled upon a note at page 71, vol. xiv, relating to the exhibition of a certain Hemipterous insect at a meeting of the Entomological Society. This note recalled to my mind that I had specimens of this very insect standing in one of my boxes of unnamed species. I at once set to work and brought it to light, and below give a description of it, as it does not appear to have been described previously. The specimens were living when given to me many years ago by Mr. W. Wilson Saunders, who informed me that he thought they had come amongst a lot of ferns he had had from the West Indies. It being found feeding on the leaves of an orchid from Bahia, rather conflicts with the foregoing statement, but Mr. Saunders may have had other plants from abroad at the same time, and finding the creature on the ferns made no further search for it.

Genus TENTHECORIS.

Head almost twice as broad between the eyes as across the crown.

Crown: anterior margin somewhat convex; face almost perpendicular, slightly convex, side lobes nearly as long as the central lobe, slightly convex exteriorly.

Antennæ placed at and close to the lower margin of the eyes, shorter than the body; 1st joint very short, 2nd elongate, gradually thickened from the base to the apex; 3rd almost cylindrical, about 1½ times as long as the 2nd; 4th and 5th thin, together shorter than the 3rd; 5th short, about 2½ times shorter than the 4th. Eyes prominent, projecting beyond the anterior margin of the pronotum, viewed from above almost globose, from the side oval, widest at the top. Rostrum reaching to between the 2nd pair of coxæ. Pronotum constricted in front, anterior margin slightly concave; lateral margins almost straight, gradually widening to the hinder angles, across which the disc is more than twice as broad as the anterior margin; posterior margin convex at the sides, very slightly concave across the scutellum. Scutellum triangular. Elytra: anterior margin convex, widest near the base of the cuneus, from whence to the apex of the membrane it is very greatly deflected. Membrane with one large triangular cell, the inner angle narrowly rounded. Legs moderate.

TENTHECORIS BICOLOR.

Deep steel-blue and red, shining.

Head red. Antennæ, 1st and 2nd joints red; apex of the former narrowly black, of the latter more or less broadly clouded with black, sparingly clothed with short semi-erect pale hairs; 3rd black; 4th and 5th yellow. Eyes very deep purplish-black.

Thorax: pronotum bright red, shining, finely punctured. Scutellum deep steel-blue, shining. Elytra, clavus and corium very finely rugose, deep steel-blue, shining; anterior margin of the latter broadly bright red, the colour gradually widening to the base of the cuneus, and sparingly clothed with short yellowish hairs; cuneus bright red, sparingly clothed with short sub-depressed yellowish hairs; inner angle deep steel-blue. Membrane darkish brown between the base and the apex of the cell; anterior margin and round the apex broadly pale, finely rugose, the wrinkles running longitudinally; cell darkish brown; cell-nerve very dark brown, with a very fine pale margin exteriorly. Legs vary in colour from reddish-yellow to red; coxæ and fulcra generally yellow.

This genus, in appearance, is not far removed from that of

Stiphrosoma, but the head is different in shape, the antennæ stouter, and the joints of the same of different relative proportions. The membrane also having but one cell, and that of a triangular shape, is an excellent guide for detecting the genus.

Lewisham : *May 1st*, 1886.

Tychius hæmatocephalus at Gosport.—In the year 1873, I announced in this Magazine the capture, at Gosport, of several specimens of *Tychius hæmatocephalus*, from under plants of bird's-foot trefoil ; since that time I have, on many occasions, searched for it without capturing another specimen. On Friday last, May 28th, having a few hours to spare, I determined to work the locality well : its old habitat after two hours' hard work, only produced one specimen of *Sitones Waterhousei*. Leaving that spot, I walked along about 800 yards further, and sat down to rest ; seeing some clumps of dried grass, I proceeded to pull them up, and shake them over my paper, when out fell quite a number of the creatures I was in search of : I had evidently accidently hit upon its head quarters. What it was doing so late in the season at the roots of the grass I am unable to say, as the bird's-foot trefoil is certainly its food-plant, and among it it will be taken later on.

I have spare specimens of *Philonthus cicatricosus*, *Tychius hæmatocephalus*, and *Mecinus collaris*, and will send a pair of each to any of your correspondents who will forward a box and return postage. I am badly in want of type specimens of English *Noctuæ* (except the commonest species), and of European butterflies, for our Natural History Society's collection ; if any one can assist me in these, of course I will pay return postage.—HENRY MONCREAFF, High Street, Portsmouth : *July*, 1886.

Homalium Allardi near Birmingham.—In July last year several specimens of *Homalium Allardi* occurred in my garden at Smallheath under bones placed to attract *Homalotæ*. This was a strictly casual and inexplicable find, as I never, before or since, met with the beetle in the district. In October *Eutheia Schaumi* turned up in a similar manner under the same conditions.—W. G. BLATCH, 214, Green Lane, Smallheath, Birmingham : *July 15th*, 1886.

Homalota eximia at Bewdley.—On May 1st I paid a visit to the banks of the Severn at Bewdley, in search of *Homalotæ*, and amongst my captures were two specimens of *H. eximia*, a species hitherto found, I believe, only in Scotland. They occurred in a sandy place, the habitat of *Ammœcius brevis*. I have carefully collated my insect with both Sharp's description and Rye's types. At the same time I secured a few *Tachyusa scitula*, a species not previously recorded from the locality.—ID.

Phlœophagus spadix, Hbst., near Newhaven.—During a ramble with my friend Mr. J. J. Walker in the neighbourhood of Newhaven, Sussex, on June 3rd, we had the pleasure of finding this beetle in some numbers in old timber. A few *Bryaxis Waterhousei* also occurred under stones.—J. H. A. JENNER, 4, East Street, Lewes : *June 22nd*, 1886.

The unusual scarcity of large Lepidoptera.—We are apt to fancy that a hard winter is good for insect life; but somehow the period of prolonged cold this year from the early days of January to past the middle of March does not seem to have had a beneficial effect.

The cold spring that followed the prolonged winter had the further effect of retarding the appearance of many species. When *Anthocharis cardamines* first made its appearance in this locality I am quite unable to record, not having seen a single specimen. On June 5th I saw the first specimens of *Chrysophanus Phlæas*, and also *Cœnonympha Pamphilus*. Not a single "blue" has yet been seen by me. *Hipparchia Janira* appeared with the very hot weather of July 4th to 7th.

All the fields about this neighbourhood have been unusually full of sorrell, so as to look quite red; I am very curious to know whether that feature of the landscape will be followed by the same profusion of *Chrysophanus Phlæas*, which occurred some twenty years ago, when I counted 300 of the butterfly one morning on one long border of geraniums against a wall. The Geometric spiders had then an unusual feast of butterflies, for the specimens of *Phlæas* got entangled by dozens in the spiders' webs, where they might be seen hanging like "ropes" of onions. I always look back on that as one of the most extraordinary entomological sights I ever saw, and regret much that I did not make any record of the date of such an occurrence.

Arctia Caja must have been getting scarcer here for some time, but certainly this year I have not seen a single larva; formerly it used to be so very common. Of *Spilosoma menthrastri* I have only seen a single specimen, though of *lubricepeda* I have seen a fair proportion. The larva of the latter species regularly eats my ferns to bare mid-ribs every September, and last autumn I noticed for the first time larvæ of *Euplexia lucipara* also devastating the ferns.

I may here remark that the most striking character of the larva of *lucipara* had escaped my notice, till I had the larva actually before me. I allude to the *two conspicuous, slightly raised, small white spots on the back of the twelfth segment.* They are visible enough in Hübner's figure, when you know you have to look for them.

Most of my correspondents complain of the scarcity of *Lepidoptera* this season; but perhaps some may have been exceptionally fortunate, and may be able to record a different experience.—H. T. STAINTON, Mountsfield, Lewisham: *July* 10*th*, 1886.

Description of the larva of Pœdisca bilunaria.—Although I have been examining birch catkins for a few years past, I have not chanced to meet with the larva of this species until the present spring, when it occurred in almost all the gatherings of catkins which I made. It is full-fed later than any of the five species which I have at present found feeding in birch catkins; the larvæ were full-fed this year about the end of April: the first began to make its cocoon on the 25th, but did not pupate until about a week later, and emerged on the 3rd of June. In colour, the larva is yellowish-white, with the head blackish-brown, as is also the second segment and the front legs. It is rather swollen and slightly flattened about the central segments. Head and anal segments small; spiracles distinct, but not large, with two smaller spots above each, which are rather more forward than the spiracle: dorsal line darkish; the intestinal canal showing through the skin of the sixth and seventh segments as a large, dark, irregular blotch. On the second segment the dorsal line shows as a slender faint line; sub-dorsal line indicated by a row of spots, two on the side of each segment, the anterior one being the higher; a dark spot on the ventral pro-legs, with a smaller one above it; anal pro-legs with one dark spot; anal plate ovate, edged with brownish, and with two dark spots on the upper edge; the preceding (12th) segment has a large, long, dark spot or dash placed across the dorsal line, with a small spot at each end; skin smooth, with very minute hairs from the spots. When approaching full-growth, the larva is often nearly as large in girth as the catkin it inhabits, and, of course, eats away the entire inside of the catkin, the outer surface of the catkin being carefully webbed inside and so held together. When touched, the larva has the habit of exuding a dark fluid. The first that indulged in this freak made me believe I had crushed its head, but I could not detect any injury, and an imago was afterwards produced from it, and subsequently I have noticed other larvæ do the same. Pupation takes place sometimes in the catkin, or, rather, in the cylindrical web coated with the outer skin of the catkin, at other times it is between, or under, dead leaves in a white silken web. The pupa is a delicate light brown, the dark intestinal blotch already mentioned showing until the pupa case begins to darken previous to the emergence of the insect. Eye-cases rather projecting, and slightly darker. Two rows of minute points on the back of each segment.—A. Balding, Wisbech: *June 7th*, 1886.

Ochsenheimeria vaculella in abundance at Lewisham.—On July 12th I was fortunate enough to capture one hundred and fifty specimens of the little known *Ochsenheimeria vaculella* under the bark of one willow here; on the 10th I took about fifty. I imagined it was partial to willow, but found it also under the bark of alder and oak.—Alfred Beaumont, 30, Ladywell Park, Lewisham: *July 14th*, 1886.

Ponera punctatissima, Rog., at Bromley, Kent.—Whilst sweeping for *Coleoptera* in a wood near here, on the evening of the 1st July, I captured a winged female of a *Ponera*, which I thought, of course, was *contracta*, but never having taken the species before, I was very glad to meet with it; I was, therefore, considerably surprised to find on examination that my insect was *punctatissima*, instead of *contracta*, especially as I had always regarded the former species as a very doubtful native, it generally having occurred in houses, &c. Near the wood are situated several recently erected houses, and it may possibly have escaped from one of these; but I thought its capture in such a locality was at any rate worth recording. I may add that I have been twice to the locality since, but have been unable to secure other specimens.—Edward Saunders, St. Ann's, Mason's Hill, Bromley, Kent: *July 12th*, 1886.

The South London Entomological and Natural History Society, *June 17th*, 1886: R. Adkin, Esq., F.E.S., President, in the Chair.

Messrs. A. T. Storey and A. Eland Shaw were elected Members.

Mr. Jager exhibited *Erastria venustula*, Hb., from Horsham. Mr. E. Cook, *Heliaca tenebrata*, Scop., and *Emmelesia albulata*, Schiff. Mr. Sheldon, forms of

Hepialus lupulinus, L., and bred series of *Earias chlorana*, L., and *Crambus chrysonuchellus*, Scop. Mr. Frohawk, *Acontia luctuosa*, Esp., from Cudham, and the life-history of *Cidaria silaceata*, Hb. Mr. Wellman, *Nemeobius Lucina*, L. Mr. W. A. Pearce, *Pygæra pigra*, Hufn., also *Cucullia verbasci*, L., from larvæ found at Mickleham. Mr. J. T. Williams, *Acronycta alni*, L., and a fine series of *Aphomia sociella*, L., bred from the cluster of cocoons found by him under a stone in his garden at Foots Cray, and which were exhibited by Mr. Billups at the meeting of the Society held on the 15th April last. Mr. Billups exhibited large groups of the larvæ of *Hyponomeuta padellus*, L., which he said he had received from Gravesend, and he understood that an enormous amount of damage had been caused by these larvæ to the whole of the apple orchards in Kent and Oxfordshire. A discussion then took place as to the probable cause of the appearance in such large numbers of these larvæ, and the best means of exterminating them, in which Messrs. Adkin, Tugwell, J. T. Williams, Chaney, Wellman, West, and others took part. Mr. Billups also exhibited the following *Ichneumonidæ* bred by Mr. Elisha: *Colastes braconius*, Hall, from *Lithocolletis spinicolella*, Kol., Sta.; *Apanteles bicolor*, Ns., from *Lithocolletis lantanella*, Schr., Sta.; *Limneria interupta*, Gr., from *Sericoris euphorbiana*, Frr.; also *Mesoleius sanguinicollis*, Gr., and *Pimpla brevicornis*, Gr., both bred by Mr. Wellman from *Gracilaria stigmatella*, Fb., Sta.; and he also exhibited two species of *Tenthredinidæ—Allantus viennesis*, Schr., and *Hylotoma cæruleipennis*, Ktz., taken *in copulâ* at Hayling Island on the 7th June.

July 1st, 1886: The President in the Chair.

Dr. C. Mordaunt Matthew, and Messrs. Pawsey and R. E. Salwey were elected Members.

Mr. T. W. Hall exhibited a varied series of *Lycæna Icarus*, Rott. Mr. W. West, some interesting forms of *Acronycta megacephala*, Fb. Mr. E. Joy, *Anesychia decemguttella*, Hb., Sta., bred from larvæ beaten near Wicken Fen. Mr. South, *Eupithecia togata*, Hb., bred from Perthshire pupæ, and a fine variety of *Melanippe fluctuata*, L., taken on a fence in the neighbourhood of St. John's Wood. Mr. Wellman, *Thecla rubi*, L., in one specimen the white spots on the under-side being absent; a variety of *Lycæna Icarus*, Rott., a long series of *Eupithecia rectangulata*, L., var. *nigrosericeata*, Haw., and a light gray variety of the same species; also a series of *Aciptilia galactodactyla*, Hb., bred from larvæ taken during the Society's excursion to Horsley on the 29th May last. Mr. Sheldon, *Angerona prunaria*, L., *Dianthœcia conspersa*, Esp., bred from Deal larvæ, *Asthena luteata*, Schiff., and *Phoxopteryx derasana*, Hb., from Riddlesdown. Mr. Billups exhibited two living larvæ of *Boarmia repandata*, L., handed to him by Mr. South, and which showed a curious arrangement of the cocoons of a species of *Panteles*; the larvæ spun a little pad of silk, then bent themselves into a bow on the twig and the parasites began to creep out of the host and form their cocoons to which the larvæ seemed to be affixed.—H. W. BARKER and W. A. PEARCE, *Hon. Secs.*

ENTOMOLOGICAL SOCIETY OF LONDON, *Jnly 7th*, 1886: J. JENNER WEIR, Esq., F.L.S., Vice-President, in the Chair.

Mr. S. H. Scudder, of Cambridge, Mass., United States, was elected a Foreign Member of the Society.

The Rev. H. S. Gorham exhibited specimens of *Eucnemis capucina* (Ahr.), a species new to Britain, discovered in June last in an old beech tree in the New Forest. He also exhibited specimens of *Cassida chloris*.

Dr. Sharp exhibited larvæ of *Meloë*, and read notes on their habits; and Mr. Saunders exhibited a specimen of *Halictus* infested with about thirty *Meloë* larvæ.

Mr. Billups remarked that he had recently found forty-seven larvæ of *Meloë on* a specimen of *Eucera*.

Dr. Sharp said that he was of opinion that the operations of these larvæ were not the result of instinct, but were more like reflex actions; the instant the larvæ touched a suitable surface they clung to it. The discussion was continued by Prof. Riley, who disagreed with Dr. Sharp, and believed that these larvæ were guided by instinct, as they showed a decided preference for particular hosts.

Mr. Jenner Weir exhibited a male of *Lycæna bellargus* and a female of *L. Icarus*, which had been captured in *copulâ* by Mr. Hillman, and shown to the exhibitor at the time of capture. Mr. Weir also exhibited some specimens of *Lycæna* which he believed to be hybrids between *Lycæna bellargus* and *L. icarus;* and he further exhibited, on behalf of Mr. Jenner, four specimens (all males) of *Phosphænus hemipterus*, taken at Lewes.

The Rev. W. W. Fowler exhibited two specimens of *Chrysomela cerealis*, lately taken by Dr. Ellis on Snowdon; and also two specimens of *Actocharis Readingi* found at Falmouth by Mr. J. J. Walker.

Mr. E. B. Poulton called attention to the fact that the larvæ of some *Lepidoptera*, if fed in captivity on an unusual food-plant, subsequently refused to eat their ordinary food-plant. He stated that he had observed this with the larvæ of *Pygæra bucephala* and *Smerinthus ocellatus*. Mr. Stainton, Mr. Fowler, and others, made some remarks on the subject.

Mr. Elisha exhibited a series of bred specimens of *Geometra smaragdaria*, together with the cocoons, containing the empty pupa-cases, attached to the stems of the food-plant.

Mons. Alfred Wailly, who was present as a visitor, exhibited a long series of silk-producing moths, including some remarkable hybrids between *P. Cecropia* and *P. ceanothi;* and Professor Riley and Mr. Weir made some observations on these hybrids.

Dr. Sharp read a paper on "*Eucnemis capucina* (Ahr.) and its larvæ."

Dr. Dunning read a report on the subject of the importation of humble-bees into New Zealand, from which it appeared that the efforts of Mr. Nottidge, of Ashford, and the Canterbury (N. Z.) Acclimatization Society, had been successful, and that the long-wanted clover-fertilizer had at length been established in New Zealand.

Mons. Peringuey communicated "Notes on some Coleopterous Insects of the family *Paussidæ*."

Mr. J. B. Bridgman communicated "Additions to the Rev. T. A. Marshall's Catalogue of British Ichneumonidæ."

Prof. Riley read "Notes on the phytophagic habit, and on alternation of generation, in the genus *Isosoma*." In this paper Prof. Riley described, from direct observation, the phytophagic habit in two species of the genus. He also established the existence of alternation of generation which was believed to be the first recorded instance in the *Chalcididæ*.—H. Goss, *Secretary*.

THE EUROPEAN SPECIES OF THE GENUS *CERYLON*.

BY REV. W. W. FOWLER, M.A., F.L.S.

Having had occasion to study the British species of *Cerylon*, and having found the genus, although a very small one, involved in considerable confusion and uncertainty, I set about obtaining representatives of the known European forms, and through the kindness of Herr Reitter I have been enabled to obtain examples of all of them, as he was good enough to entrust to the post even his almost unique example of *C. atratulum;* in the following notes I am much indebted to Herr Reitter's paper in the Deutsche Entomologische Zeitschrift, XX, 1876, Heft. ii, p. 386, to which the student of the genus is especially referred, a particularly good plate of the several species being given with the paper, which is worth far more than any mere description.

The genus *Cerylon* belongs to the *Colydiidæ*, and, until quite recently, in conjunction with the single genus *Philothermus*, formed the tribe *Cerylonina*, which is distinguished from all the other tribes of the *Colydiidæ* by the small acicular terminal joint of the palpi, the penultimate being large and thick; the first ventral segment of the abdomen is elongate, and all the coxæ are more or less widely separated. From the allied genus *Philothermus* the genus *Cerylon* is distinguished by having the club of the antennæ plainly divided into two joints, whereas in *Cerylon* it is, at all events, to all intents and purposes, one-jointed, although the ridged appearance before apex (so evident in *Rhizophagus*) indicates that the antennæ are really eleven-jointed, and the club two-jointed. I believe that lately one or two genera have been added to the tribe, but I have been unable to obtain access to the descriptions, and these are, of course, not necessary for the present paper. The species of *Cerylon* are small, oblong or oval, and more or less depressed, robust insects; they live under the bark of decayed trees, logs, &c.; the described species are upwards of thirty in number; these are widely distributed throughout the world, being found in North and South America, Ceylon, Tahiti, New Caledonia, Madagascar, &c. In the catalogue of Heyden, Reitter, and Weise, eleven species are enumerated as European; some of these are exceedingly closely allied, and there is considerable confusion regarding them: the chief difficulty of determination lies in the fact that the shape of the thorax differs very much in the male and female of the same species, in some being subquadrate or even transverse in the male, with the sides rounded and widened in front, whereas in the female the same part is longer and narrowed towards the front, being broader at the base; this is very noticeable in many examples of our common *C. histeroides*, which is very variable in the shape of the thorax.

The European species may be thus divided :—

I. Antennæ with the third joint much shorter than second.

- i. Thorax very finely punctured, very broad : general form broad, with elytra strongly widened in middle : striæ of elytra finely punctured . *C. magnicolle*, Reitter.
- ii. Thorax finely punctured, but more distinctly than in the preceding species : general form oval, with elytra not strongly widened in middle : striæ of elytra finely punctured .... *C. semistriatum*, Perr.
  conicicolle, Reitter.
  ætolicum, Reitter.
- iii. Thorax strongly punctured : general form oblong : striæ of elytra more strongly impressed and more coarsely punctured.. *C. evanescens*, Reitter.

II. Antennæ with the second and third joints of about equal length.

- i. Form, broader : upper surface pitchy-brown or nearly black.
  - 1. Antennæ more slender : basal impressions of thorax transverse, and rather shallow : thorax rather closely punctured... *C. histeroides*, F.
  - 2. Antennæ thicker : basal impressions of thorax longitudinal and deep : thorax strongly and sparingly punctured .... *C. fagi*, Bris.
- ii. Form narrower and more parallel.
  - 1. Upper surface black : thorax with a slight prominence on each side margin, just at beginning of posterior third... *C. atratulum*, Reitter.
  - 2. Upper surface nearly always ferruginous-testaceous : thorax without prominences at sides.
    - A. Upper surface slightly convex : sides of thorax almost parallel : basal impressions of thorax distinct : striæ of elytra rather fine, becoming evanescent towards apex... *C. ferrugineum*, Steph.
    - B. Upper surface much depressed : striæ reaching apex.
      - *a*. Thorax quadrate with basal impressions large and distinct : striæ of elytra stronger . ... *C. impressum*, Er.
      - *b*. Thorax oblong, very slightly narrowed towards base, with basal impressions very indistinct : striæ of elytra less strong... *C. deplanatum*, Gyll.

C. MAGNICOLLE, Reitter.

Rather broad and convex, lighter or darker ferruginous : antennæ moderate, with third joint much shorter than second : thorax broad, with sides rounded and dilated in front in male, somewhat narrowed in front or almost parallel in female, very finely punctured : elytra dilated at sides at about one third the distance from base, and thence gradually narrowed towards apex : striæ of elytra (except sutural stria) evanescent for apical third. Long., 2 mm.

My specimens are from the Caucasus.

I do not feel at all certain as to this species, and am inclined to believe that it is only a form of *C. semistriatum*, which appears to be very variable; Herr Reitter, in his plate (Deutsche Ent. Zeit., 1876, Tafel ii), gives two figures which he names *C. ætolicum* ♂ and ♀ respectively, but in his own copy of his paper, which he has kindly sent me, he styles them *semistriatum* (*ætolicum.* pars) and *magnicolle* (*ætolicum.* pars), and he has since the date of his first paper separated this latter species.

C. SEMISTRIATUM, Perr. (*attenuatum*, Fairm., *ætolicum*, Reitter., ? *spissicorne*, Fairm.).

This species differs very slightly from the preceding; the thorax, however, is a little more distinctly punctured, and the general form is more oval, the elytra not being dilated at anterior third: the species much resembles *C. histeroïdes*, but is more convex and finely punctured, and more narrowed in front; the striæ also of elytra are finer, and the relative proportions in the length of the second and third joints of the antennæ is different; the colour also is ferruginous. Long., 2 mm.

Under oak-bark, South of France, &c.

v. conicicolle, Reitter.—This variety is smaller than the type form, and has the thorax more contracted in front; the general form is somewhat more oval and convex. Reitter considers this to be a separate species, and it is very possible he may be right. Long., 1¾ mm.

Caucasus Mountains.

C. EVANESCENS, Reitter.

This species is easily distinguished from the two preceding by its more oblong form, more strongly punctured thorax, and deep and strongly impressed and punctured striæ of elytra, which become evanescent towards apex, with the exception of the sutural stria which is deeper at apex; the thorax is broader than long with the sides almost parallel, and the anterior margin deeply sinuate-emarginate, so that the anterior angles are pronounced and prominent; from all the following species it may be distinguished by the second joint of the antennæ being much longer than third.

Under beech-bark. Transylvania, Croatia, &c.

C. HISTEROIDES, F.

Dark pitchy-black (ferruginous or reddish-ferruginous in immature examples), not very convex, with the antennæ and legs ferruginous; thorax thickly and rather strongly punctured, in the male a little shorter than broad, and a little widened and rounded in front, so that its greatest breadth is before middle: in the female it is just as long as broad, very slightly and almost imperceptibly narrowed in front, so that it is broadest at base: elytra slightly dilated and widened at sides, rather depressed, with distinct striæ, which are plainly punctured, and usually become obsolete near apex; interstices flat, finely punctured in more or less irregular rows, legs reddish or pitchy-red. Long., 2–2½ mm.

This species appears to be common and widely distributed over a considerable part of Europe; it occurs under bark of pines, elms, oaks, and many other trees; it has also been taken in nests of *Formica rufa*; the shape of the thorax is variable and this has given rise to much confusion: it is by far the commonest of the British species.

v. caucasicum, Reitter.—This variety (considered a separate species in the catalogue of Heyden, Reitter, and Weise) differs from the type in being ferruginous in colour, and in having the sides of the thorax nearly parallel in the male, and more distinctly contracted in front in the female than in the corresponding sex of *C. histeroides* proper.

Found in the Caucasus region.

v. longicolle, Reitter.—This is a form of the preceding variety, and appears to be chiefly distinguished by its longer thorax.

Eubœa, &c. In Dr. Sharp's collection there is a specimen answering to my specimen from Herr Reitter, which is labelled as bought from Turner; whether it is Scotch or English I do not know. I also possess a small ferruginous-red variety from Silesia, which closely resembles *C. ferrugineum.*

C. FAGI, Bris. (*forticorne*, Muls.).

A very distinct species, broader and more convex than *C. histeroides*, and with the elytra more dilated in front; the antennæ are shorter and stouter, ferruginous, with the first and last joints lighter, and the thorax is evidently more strongly and much more sparingly punctured, especially on disc, and at the base is furnished with larger impressions, which are oblong, and more distinct than in the preceding species: the thorax, moreover, is almost parallel-sided in the male, and evidently narrowed in front in the female: the striæ of the elytra are rather finely punctured, and the interstices, as a rule, are almost smooth; the colour of the upper surface is as in *C. histeroides.* Long., 2–2½ mm.

Under beech-bark; Hungary, Transylvanian Alps, France, &c.; England, rare, Sevenoaks, Cobham Park, Kent, Twickenham, St. Mary Cray, Dean Forest; Mr. W. G. Blatch possesses one specimen from the latter locality which is remarkable for its very short rounded elytra.

v. excavatum.—Through the kindness of Mr. E. Saunders (who considered it probably a new species), I received some time ago from Mr. W. J. Saunders a remarkable variety of this species, in which the basal impressions are continued nearly to the anterior margin, leaving a large broad raised longitudinal space in middle. I have seen no others like them, and propose for the variety the name of *excavatum*; the specimens were taken at Warlingham, Surrey; it is possible that they may be identical with *C. foveolatum*, Baudi, but I have never seen a specimen of this species or the description; it is, moreover, omitted in the last European catalogue, and Reitter (*l. c.*, page 389, foot note,) states that it is unknown to him.

C. ATRATULUM, Reitter.

Very like *C. ferrugineum*, but quite black, antennæ black, with the apex of the last joint pitchy; elongate, parallel-sided, depressed; thorax longer than broad, parallel-sided, with a slight prominence or sinuation on each side-margin just at beginning of posterior third; this is not very marked, and is not so distinct in the actual specimen as in Reitter's plate (*l. c.*): the elytra are oblong, with two indistinct, broad impressions towards base, with rather deep punctured striæ, which are continued to apex or nearly to apex; legs black. Long., 2 mm.

Under beech-bark: two male specimens found by Herr Reitter in North-east Hungary, in a mountainous district.

C. FERRUGINEUM, Steph. (*angustatum*, Er.).

Rufo-ferruginous, oblong, parallel-sided; smaller and narrower than *C. histeroides* to light specimens of which species it bears a considerable resemblance: thorax rather strongly punctured, thickly at sides, less thickly on disc, in male a little longer than broad, very slightly widened in front, in female evidently longer than broad, parallel-sided, basal impressions distinct but not large: elytra with sides a little rounded, with rather strong punctured striæ, which, at sides, are more or less evanescent towards apex, first interstice next suture with a row of very fine punctures: sutural stria evidently deepened at apex. Long., 2–2¼ mm.

Common throughout North and middle Europe under bark of all kinds of deciduous trees, especially beeches: local in England, but widely distributed. Cobham Park, Kent, New Forest, Dean Forest, Cannock Chase, &c.; Scotland, Rannoch, Aviemore, &c.

C. IMPRESSUM, Er.

Exceedingly like the preceding but a little more depressed and broader, with the thorax especially broader, being almost quadrate in the male, and quadrate in the female; in the former sex it is slightly transverse, and has the sides feebly dilated and rounded in front; the basal impressions are much larger, and the striæ of the elytra are markedly stronger; they become feebler behind but reach the apex, or very nearly so; the sutural stria is evidently deepened at apex. Long., 2–2¼ mm.

A rare species in central and southern Europe: it does not apparently occur in Britain; it appears, however, to vary as regards size of basal impressions, &c., and I have a variety, from the Morea, in which these impressions are quite small as compared with the type-form; I have seen specimens from Aviemore and the Dean Forest which are somewhat intermediate forms, but I have never seen a typical British specimen of *impressum*, and would refer these specimens to *ferrugineum*: there is so much difficulty attached to these last three species of the genus, that it is only on quite typical forms that a species should be introduced as indigenous.

C. DEPLANATUM, Gyll.

Closely allied to *C. ferrugineum*, but rather smaller and more depressed; it is the flattest species of all that have been described: in the male the thorax is evidently, although gradually, narrowed towards base, in the female the sides are almost straight, in both sexes it is longer than broad; the basal impressions are very small, and often only indicated by a very narrow fovea at base, which sometimes is almost absent; this point will distinguish it from both the preceding: the striæ of the elytra are moderate and reach apex; the sutural stria is, however, not deeper at apex. Long., 1¾–2 mm.

Rare; under bark of beech, aspen, and poplar, and, probably, other trees; Central Europe. The species appears to be very rare in Britain; I have only seen two or three examples, taken, I believe, by Mr. Gorham in the New Forest; most of the specimens that stand under the name appear to be small varieties of *ferrugineum*.

The larva of *C. histeroides* is described by Perris (Ann. Fr., 1853, p. 616): it is elongate, somewhat parallel, entirely white, with reddish head; head depressed, antennæ four-jointed, first joint thick and short, second shorter and much narrower, third longer than the first two together, fourth slender and very long, as long as all the rest united; maxillary palpi three-jointed, last joint elongate; prothorax longer than either meso- or metathorax, both of which are longer than the abdominal segments, which are of equal lengths until the last, which is somewhat developed, and has on the back two papillæ, each furnished with a long hair; it is deeply emarginate behind, and the lobes of the emargination appear to be trifid at apex; tarsi short and stout, three-jointed; legs ciliate. The larva, according to M. Perris, lives in the galleries of *Hylurgus piniperda* of which it destroys the larva; it also occurs on other trees than pine trees under different circumstances.

The following appears to be the true list of our British species:—

- *C. histeroides*, F.
    - *v. longicolle*, Reitter.
- *C. fagi*, Bris.
    - *forticorne*, Muls.
    - *v. excavatum*.
- *C. ferrugineum*, Steph.
    - *angustatum*, Er.
- *C. deplanatum*, Gyll.

In conclusion, I must thank Dr. Sharp, Mr. Blatch, Mr. Champion, Mr. Gorham, and others, for lending me specimens; altogether I have been enabled to examine some hundreds of British examples of the genus; among these are certain forms concerning which I still feel doubtful, but I believe they are all to be referred to one or other of the four species just mentioned.

Lincoln: *July 9th*, 1886.

NOTE ON SOME BRITISH *COCCIDÆ* (No. 4).

BY J. W. DOUGLAS, F.E.S.

LECANIUM ALIENUM, *n. sp.*

For three or four years past a house-fern (*Asplenium bulbiferum*) has been infested with a *Lecanium* to that extent that the fronds have withered under the constant attacks of the individuals that, in all stages of life and overlaying each other, cover them constantly except in the winter months.

When young the scales are flat and yellowish, very like *L. hesperidum* at the same age; at a later stage they mostly become faintly maculated. When full-grown they are, at the maximum, 3½ mm. long by 2¾ mm. broad at the widest part, forming a long oval much widened posteriorly, convex, pale greenish-yellow, the disc with fuscous, coarse, irregular reticulation, anteriorly and posteriorly forming wide, darker transverse patches or bands, the meshes having rounded pale centres, but in the middle of the disc, on each side of a broad, dark longitudinal line, the ground-colour shows as a large pale patch, and similarly as two smaller spots anteriorly; on the dark median line are usually 4—5 very minute yellow elevations in a row; the prominent anal point above the fissure deeper yellowish; the margin wide but scarcely flattened, with strong, black-dotted, transverse, parallel lines throughout. On the under-side the body of the insect is pale anteriorly, fuscous-black posteriorly; the antennæ pale, of seven joints, of which the 3rd is the longest. The adult scales always cover oval yellow embryonic active larvæ, so that the females are doubtless viviparous. When removed from the fronds and dried the adult scales become of a uniform pale brown, and the sides curve under, so that the form is changed. I have not found a male.

In form this species is somewhat like *L acuminatum*, Sign., but that is only 2—3 mm. long, and appears to be without markings.

It differs from *L. angustatum*, which is narrow throughout, 4—5 mm. long by 2 mm. broad, of a clear yellow colour (apparently without markings), smooth and very flat; whereas this is wide posteriorly, distinctly convex, and is marked as stated.

It appears to resemble *L. maculatum*, Sign., only in being elongate oval, but that is a more regular oval, and has a median series of 8 or 9 brownish spots, which it is stated specially distinguish it from *L. hesperidum.*

The reticulation seems to ally it to *L. tessellatum*, Sign., the form of which is given as broad-oval, much rounded posteriorly, and somewhat flattened, the colour is red-brown, the size 3½ mm. by 3 mm., and the surface exhibits throughout a design of marquetry of irregular fine lined pattern, without other marking; whereas in *L. alienum* the form is long-oval, convex, and the reticulation and markings are formed of strong, dotted, dark lines.

The form and character of these four species are well displayed in Signoret's pl. xi, figs. 1—4.

LECANIUM HIBERNACULORUM, Boisd.

This is described as rather more than 5 mm. in length, 3½ mm. wide, and 3 mm. high, of a reddish-brown colour, globulous, forming more than a hemisphere; the surface with a somewhat regular punctuation of oval pits with a clearer central point, without perceptibly widened margin.

In February Mr. H. W. Bates sent to me from a fern in his greenhouse several scales of a *Lecanium* full of pink eggs. These scales agree in some respects with the foregoing description, but differ in the size being at most only 5×3×2 mm., in the form being broad, obtuse-oval, very convex, but not globulous, and in having 4—6 very minute, scarcely perceptible, distant tubercles in a line along the middle of the back. Dr. Signoret, however, who has seen some of the scales, is of opinion they must be referred to this species.

In October last Mr. T. R. Billups sent me from a house-fern some scales in every respect like the foregoing, except that they are about half the size, and of the colour of *café au lait*. I judged they were the young form of *L. hibernaculorum*, and Dr Signoret confirms this opinion. In May I received from Mr. P. Cameron of Sale, on various hothouse plants, fully grown and coloured scales, from which the minute tubercles above mentioned had quite disappeared. There seems to be just a possibility that the young form with the row of tubercles may indicate *L. maculatum*, Sign.

LECANIUM HEMISPHÆRICUM, Targ.-Tozz.

The ♀ scale is described as circular, hemispheric, the margin broadly flattened, red-brown and more or less shaded in the adult, 3½ mm. long, 3 mm. broad, and 2 mm. high.

From a hothouse at Canterbury Mr. G. S. Saunders, in February, obtained on an orchid and a fern some scales which fairly agree with the above description, except that they are yellow-brown, the margin comparatively slight, and the size less, 3 mm. by 2½ mm. by 1½ mm.

I submitted one of the scales to Dr. Signoret, and he coincides with me in thinking it is *L. hemisphæricum* in the young state.

In April Mr. P. Cameron sent, on several hothouse plants from Sale, larger, darker, and more developed scales of this species, and the number of similar forms simultaneously cause me to doubt if there is any reason for Signoret's query if *L. hibernaculorum* is only a large and redder form of *L. hemisphæricum*; they seem to me to have very distinct characters, which, although they vary somewhat according to age, yet never have an identical aspect.

Lecanium ulmi, Linn.

In the "Fauna Suecica," p. 265, No. 1019, Linné first noted his *Coccus ulmi campestris*: "Habitat in ulmo campestri;" in the "Systema Naturæ," p. 740, No. 9, he repeats this without any description, refers to the F. S. No. 1019, and to Geoffr. Paris, 512, No. 7; this, however, should be 507, No. 8,* which is Geoffroy's *Chermes ulmi rotundus*, thus described:—

> "Il est rond, sphérique, brun, de la grosseur et de la couleur des bayes de genièvre. Il s'attache aux petites branches de l'orme, qui quelquefois en sont si chargées, qu'elles ressemblent à des grappes."

I find such brown ♀ scales in May on elm bushes in several places in Lewisham, also ♂ scales a week or two earlier from which I obtain the imago.

Walker omits *Lecanium ulmi* from his "List of British *Hemiptera* (*Coccidæ*)," 1860, although Stephens had long previously included it in his "Systematic Catalogue of British Insects," ii, 368, 9993 (1829), as *Coccus ulmi*, Linn., giving a reference to De Geer, v (should be vi), pl. 28, fig. 7.

De Geer in his "Mémoires, vi, 436, thus writes:—

> "Gallinsecte ovale blanche, à bandes transversales brunes, de l'orme.
>
> *Coccus* (ovatus ulmi) *ovatus albus fusco transverse striatus, ulmi.*
>
> *Coccus ulmi campestris*, Linn., Faun., Ed. 2, No. 1019. Syst., Ed. 12, p. 740, No. 9.
>
> *Chermes ulmi rotundus*, Geoffr., Ins., Tom. i, p. 507, No. 8. Le Kermes de l'orme (pl. 28, fig. 7).
>
> "Ces Gallinsectes sont de figure ovale, un peu pointue à l'un des bouts, que je crois être le derriere; elles sont très-convexes en dessus, mais plates ou un peu concaves du côté qui est appliqué sur la branche; leur surface est polie, lisse et un peu luisante. Elles sont blanches et ornées de bandes transversales brunes, de sorte qu'elles ne ressemblent pas mal au ventre de quelques especes d'Araignées; mais quelquefois on en trouve de toutes brunes."

Now, it is in this country that the wholly brown scales, mentioned as exceptional by De Geer, are the only ones found, and the banded sort appear to be scarce elsewhere also, for Signoret says respecting them (Ess. Cochin., p. 263), "Under the name of *fasciatum* Costa indicates a species figured by De Geer, pl. 28, figs. 7—10, which has transverse fasciæ (described above). We think that this species is only a variety of *ulmi*, which is fasciated under certain circumstances, as we have taken the opportunity to remark respecting *tiliæ*, *corni*, &c., and which may be caused by an unhealthy condition, or by the insect not having been fecundated, or by other unknown circumstances." I may, I think, add that this marking may exist only in the young stage of life, in the same manner that maculation of the scale is frequently observed then in other species, and that it disappears when the insect becomes adult.

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* I follow Signoret and others in this. The want of a description by Linné makes his *Coccus ulmi* obscure, and the doubt as to his meaning is not lessened by his reference to "Geoffr. paris, 512, No 7," for there is no such No. 7. It is true that Geoffroy, at p. 512, No. 3, has a "*Coccus ulmi*, corpore fusco, serico albo," and a reference to "Réaumur, Ins., iv, t. 7, f. 1, 2, 6, 9, Le cochinelle de l'Orme," yet this is not cited by any author but Schrank Faun. Boic., 145, 1264 as the species intended by Linné. Schrank's *Coccus ulmi* is really the above *Coccus* (*Gossyparia*) *ulmi*, Geoffr., as is shown by his description and reference to Réaumur iv, t. 7, f. 1—10; and it is worthy of note that Réaumur is not cited by Linné for his *C. ulmi*. Fabricius (E. S, iv, 225) cites for *Coccus ulmi*, Linn., "Geoffr., 507, 8; De Geer, vi, 406, pl. 28, 7," which refer to a *Lecanium*; but by his description "Clypeus rufescens margine villoso, albido," he apparently intends *Coccus ulmi*, Geoffr. I believe, therefore, that Linné's *Coccus ulmi* is rightly a *Lecanium*.

Signoret (Ess. Cochin., p. 262) says of this species :—

> "The scale is chestnut-brown, round, hemispheric, very convex, 7 mm. long by 5 wide and high, appearing smooth under a lens, but under the microscope showing the punctuation and tesselation of *L. pyri*, *corni*, *tiliæ*, and others.
>
> "This species, very near to those described above, is distinguished by having seven joints in the antennæ, the 3rd hairless, very long, as long as the 4th, 5th, and 6th together, these three and the 7th very short and nearly equal ; the legs stout, the tarsus one time shorter than the tibia, the claw strong, the digitules very short and slender, those of the claw not extending beyond it ; the anal lobes with four hairs on the outer and two on the inner side, the genital ring with eight hairs.
>
> "The male is small, yellow ; antennæ of six joints, of which the 4th is the longest, the others diminishing consecutively to the 10th, which is very short, and has two knobbed hairs larger than the others. The pigmentary circle has ten eyes, four large and six small, or ocelli. The thorax has a broad, brown, transverse band. The abdomen a little less broad, diminishes to its extremity, which has the two ordinary long filaments, and the stylet which is as long as the abdomen ; the last segment has two small tubercles near the insertion of the filaments. The elytra are transparent, with a tint a little shaded towards the margin. The halteres are stout, and have two filaments at the extremity. The legs are very long and pubescent ; the tarsi one-fifth of the length of the tibia."

I thought it desirable to transcribe the foregoing description, not only as a definition of the species, but in order to show the nature and the minuteness of the characters relied upon for specific distinctions in this genus.

LECANIUM ALNI, Modeer.

In the "Götheborgska Vetenskaps Handlingar," i, 23 (1778), Modeer described a *Coccus alni* thus : "Female oblong-ovate, convex, light brown-reddish, without wool or farinose matter (utan ull eller doft) ; on the angles or axils of branches of alder trees."

On the 24th December last, at Lewisham, on an alder tree (*Alnus glutinosa*) growing by the side of a pond, I found such scales as these, evidently a *Lecanium* ; of course they were of the previous season and were discoloured, but I made a mental note that in the spring I would go again and get some scales of the male, but in April when I visited the place, I found to my disgust, that it had been appropriated for building purposes, the water had been drained off, the trees were dead, and there were no scales. It was not until June 9th that I succeeded in finding some ♀ scales of the *Lecanium* on an alder tree at Catford, and then it was too late to obtain male scales.

There can be no doubt that this is the *Lecanium alni* of Modeer; the special mention of the absence of wool or farinosity shows clearly that it cannot belong to the genus *Gossyparia*, as Signoret puts it (Ess. Cochin., 319). Whether the species is the *Coccus ulmi*, Linn., as I think is probable, is to be proved; *Lecanium alni*, Modeer, is given without any synonym by Walker in his list of British species. *Coccus alni*, Schrank, Fauna Boica, 144, 159, may well be Modeer's species, though it is not cited. De Geer does not notice the *Coccus alni* of Modeer, but he remarks with reference to the scales he found on willow (*C. rotundus salicis*, De G.), that he found some quite similar to them on alder, and he considered them to be of the same species (Mém., T. vi, p. 442).

PULVINARIA CAMELLICOLA, Sign.

On January 29th last Mr. Parfitt sent me from a greenhouse at Exeter a leaf of camellia on the under-side of which were several yellowish, extremely flat, oval scales, but two of them had a slightly raised brownish line down the middle. They were so like the scales of *L. hesperidum* that I deemed they were that species, which is found on many different plants; and having pinned down the leaf so as to prevent its warping, I put them in a box on one side. Looking at the leaf on February 23rd I saw that all the scales except two had dried and become loose. Of the two one remained fixed, and underneath was a developed male, dead and adherent to the scale; the other scale had disappeared, and in its place was a white, slightly convex, smooth, shining scale, which, when I attempted to raise it with a needle, broke and disclosed a male imago alive. The head, eyes, antennæ, thorax, legs, and abdomen were wholly yolk-yellow, the antennæ thickly set with short projecting hairs, the two anal filaments snow-white, the broad wings smoke-white, sub-opaque, the costal area and also the adjacent ordinary nerve faintly tinged with pink.

The male of *L. hesperidum*, and indeed of all the species of that group, being entirely unknown (excepting the very ambiguous *L. lauri*, Boisd.), I hesitated as to the name; since then I am convinced that this is the male of *Pulvinaria camellicola*, Sign., the description thereof agreeing exactly with my example; and I am the more induced to this belief that in April Mr. P. Cameron of Sale sent me, on a camellia leaf, two ovisacs of *P. camellicola*, ♀ (*c.f.* vol. xxii, p. 159), to one of which the yellowish scale remained attached, and with them a white scale of the male, precisely like that from which the male insect had emerged in February, but the perfect insect did not now come out, having died *in situ*. Signoret says that the scale of *P. camellicola* greatly resembles that of *L. hesperidum*, but the female of the latter species is viviparous, and so has no ovisac internal or external of the scale.

On May 18th, though too late for male scales, I found several female scales still attached to the peculiar, long, white ovisacs, forming conspicuous objects on the under-side of leaves of camellias, at Mr. Stainton's; so the species does not seem to be uncommon.

8, Beaufort Gardens, Lewisham:
July 10*th*, 1886.

CATEREMNA TEREBRELLA, ZK.; A *PHYCID* NEW TO THE BRITISH LIST.

BY LORD WALSINGHAM, M.A., F.L.S., &c.

PHYCITA TEREBRELLA, Zincken.

Germar & Zincken, Magazin d'Entomologie, iii, B. S., 162, No. 33.

This species is No. 598, p. 229, in Staudinger and Wocke's Catalogue of the Lepidoptera of Europe, and is well figured by Herrich-Schäffer, vol. iv, fig. 199, under the name of *Myelois terebrella*. Treitschke, who places it in the genus *Phycis*, quotes a good description of its habits in the larval stage, on the authority of Von Tischer.

On the 26th of July I observed, near the garden here, some small aborted cones on a well-grown tree of *Abies Douglasii*. These cones usually formed part of a group of three or four, the others being fully developed. They were from an inch to an inch and a half in length, and had apparently become dried up and shrivelled before the formation of the seeds or the growth of the woody scales. The first I examined contained a living pupa, which was unfortunately crushed; in the second I found a larva, and, as I immediately recognised that its habits differed from those of *Nephopteryx decuriella*, Hb. (*abietella*, S. V.), I collected as many as I could find, and within the next two days specimens of a *Phycid*, obviously new to the

British list, appeared from amongst them. I at once sent one of these to my friend Mons. Emile Ragonot, whose Revision of the British species of *Phycitidæ* and *Galleridæ* appeared in the last volume of the Ent. Mo. Mag. I quote the following from his answer to my letter:

> "It is the *Euzophera terebrella*, Zk., of our list, but the insect has been separated by Meyrick from the true genus *Euzophera*, because veins 4 and 5 are from a point, whilst in *pinguis* they are forked. Mr. Meyrick created the genus *Cateremna* for *terebrella* and an allied Australian species which I have not seen. The larva of *terebrella* has been described by Von Tischer in Treitschke, and he mentions that the cones are aborted. Zeller (Isis, 1848, p. 663) also distinguishes it from another cone-feeder, *Dioryctria decuriella*, Hb. (*abietella*, W. V.). It is an interesting but rather dangerous novelty for the British fauna."

Abies Douglasii, a native of California, has, like other introduced firs and pines near it, been raised from seed, and the particular tree on which this interesting species occurs is one of luxuriant growth about 30 or 35 years old. The spot on which it grows has long been my favourite collecting ground, and has been searched for *Lepidoptera*, in July and August especially, for the last 23 years with few exceptions, probably several times in every season. I can scarcely believe that the species could have been overlooked had it occurred in any abundance in the course of at least the last ten years. Other trees of the same species are found at about half a mile from this spot, but, although one or two aborted cones were present on one of them, no traces of this larva could be discovered. It is sufficiently evident that however destructive the habits of this insect may be elsewhere, it has not yet become a source of danger to fir trees in this country.

For those who have not access to the German works the following description may be found useful:—

Antennæ brownish-fuscous.

Head and palpi greyish-fuscous, the base of the haustellum white.

Thorax and fore-wings brownish-fuscous, interspersed with whitish scales. The most conspicuous markings being an oblique narrow fascia about one-third from the base of the wing, tending outwards to the dorsal margin. This fascia is angulated outwards on the fold and inwards below it. Commencing about the middle of the costa is a conspicuous white patch, which reaches half across the wing, and contains two fuscous spots, the one at its lower edge, the other immediately above it. Below this patch a few white scales are scattered across the wing towards the dorsal margin. Beyond, but separated from it by a brownish-fuscous interspace, less wide than that following the first fascia, is a narrow, waved, white, transverse streak, angulated inwards below the costa, the angle pointing to the upper spot in the white patch, angulated outwards slightly above the middle, and again inwards immediately above the anal angle. Along the apical margin is a row of six or seven brownish-fuscous spots separated by whitish scales. Fringes grey. On the under-side of the fore-wings a pale costal spot indicates the upper end of the white waved outer line.

Hind-wings shining grey.

Abdomen slightly darker than the hind-wings, anal tuft pale ochreous.

This description is taken from two males, of which the expanse of the wings is 8 lines. I have received from Mons. Ragonot a specimen of the female from Germany, in which the expanse of the fore-wings is 10 lines.

Sufficient time has not yet elapsed to prove whether the larvæ collected in some of the aborted cones in which this *Phycid* has been bred are really those of the same species, but I think there can be little doubt of this, and, in any case, there should be no difficulty in verifying the fact in due time. Several empty pupa cases have been found enclosed in a light silken web surrounding the hollow interior of the aborted cones.

A description of a larva which is now feeding should be easily recognised :—

Head pale brown.

Second segment with an undivided plate or shield slightly paler than the head; the anterior edge straight, posterior edge convex. On each side of the shield on the same segment is a small reniform chitinous spot.

The remaining segments semi-transparent, greyish-white. The dorsal vessel dark grey. The 3rd and 4th segments are traversed by a transverse line of very pale brown slightly tuberculated spots, three on each side of the centre, each of these spots bearing a single delicate whitish hair. The penultimate segment with three small, pale brown, chitinous spots, the middle one being the largest. The last segment is almost completely covered above by a circular chitinous plate of a brownish colour. Segments 5 to 11 have each four slightly tuberculated spots, arranged in the form of a square above, with two more at each side, one beneath the other, opposite to the centre of the segment.

Length, about 4½ lines, when apparently about half-grown.

All the spots are very pale brown, each bearing a single hair.

Merton Hall, Thetford, Norfolk :
August 1*st*, 1886.

P.S.—Since writing the above I have taken a fine female of *Ceteremna terebrella*, Zk., flying among common spruce firs, at a distance from the place where I found the larvæ. I have also found traces in aborted cones on common spruce, of a larva feeding in the same manner as those on *Abies Douglasii*. I am inclined to believe that *C. terebrella* will be found to be widely distributed, and by no means uncommon.—*August* 18*th*, 1886.

A NEW SPECIES OF *BRATHINUS* (*SILPHIDÆ*).

BY GEORGE LEWIS, F.L.S.

In the autumn of 1884, I received from Yezo, through the medium of a Japanese collector I had sent in the previous spring to explore the district of the Ishikari River, a species of the genus *Brathinus*, and as the discovery adds another peculiar and interesting form to the list of insects whose congeners live in what are now, from a physical and geographical point of view, the most divergent of countries, viz., Japan and America, I think it well to offer an independent record of the capture to the Ent. Mo. Mag. Leconte has described in the Proc. Acad. Phil., vi, 1852, p. 157, two species of *Brathinus*, and these, with the Japanese species, are all that are known at present.

BRATHINUS OCULATUS, *n. sp.*

Elongate, little convex, reddish-brown, smooth and shining. Antennæ with the first seven and the 11th joints brown, 8th, 9th, and 10th white; palpi piceous; legs pale. Head transverse, black; forehead concave; eyes large and prominent, coarsely granulate; neck inconspicuous; thorax smooth, convex, rounded anteriorly, and somewhat elongate behind; elytra very finely punctulate, in colour dark, with the suture narrowly, and lateral margins broadly, pale. Length, 4 mm.

Through the kindness of Dr. Sharp, I have before me examples of *B. nitidus* and *varicornis*, and the chief points of difference I see between the three species are as follows: *B. oculatus* differs from *nitidus* in the three white joints of the antennæ, much more transverse head and prominent eyes, and in the comparatively small and inconspicuous neck. From *varicornis* it differs in having three white joints of the antennæ, instead of two, black head, in the place of brown, with more prominent eyes, and by the elytra being free of setæ. The setæ of the elytra are a salient character in *varicornis*.

I only possess five specimens of *oculatus*, and three are unfortunately in bad condition; in size it is intermediate between *nitidus* and *varicornis*, the last-named being the smallest.

Wimbledon, London:
June 15*th*, 1886.

On the specific identity of Tephrosia crepuscularia, W. V., and biundularia, Esp.—Some time in the year 1878 my late kind correspondent Professor Zeller wrote as follows:—"I wonder why Staudinger separates these" (*crepuscularia* and *biundularia*), "I deny their specific right, not allowing the time of appearance to prove it. With us both are together, and, moreover, a dark variety." At the same time he sent me dark grey specimens, with a challenge to pronounce as to which they belonged, which, however, I was quite unable to do. As I was at the time closely engaged in other work, and living, moreover, in a district in which there was little opportunity of studying either form, the matter was deferred ; and recently it has been taken up by others, and some very interesting papers on the subject have been published, but I still think that a little remains to be said.

As I understand it, the alleged distinction between the two species or forms consists in two points :—The *ground colour*, which in *crepuscularia* is brownish, in *biundularia* whitish ; and the *time of appearance*, which in *crepuscularia* is from February to April, according to the season, in *biundularia* May and June. A third point has been put forward, the double broodedness of *crepuscularia* as distinguished from the other, which is said to be single-brooded ; but this is a mistake. I have taken second brood specimens of both forms in July or August, in the south of Surrey, and have them now before me. It can hardly be necessary to point out that this is with very many species a mere question of latitude, species being single brooded in the north, or even in the midlands, which are double, or partially double brooded in the south of England.

As we have these forms in the south then, *crepuscularia*—emerging generally in March or April—has the ground colour *whitish*, *almost entirely obscured* by lighter or darker brown dots, or by a brownish clouding towards the costal and hinder margins. The first line faintly indicated, brown, and accentuated generally by three black spots situated on nervures. Second line brown, with a black spot at *every* nervure, those in the middle being the most distinct. This line has a duplicate in lighter brown just beyond it, and in this, opposite the two large central spots, is a somewhat square, dark brown, blotch, sometimes conspicuous. Between the first and second lines is a faint brown central shade, darker at the costa, and having two black dots in the middle. Before the hind margin is a third line, broken and disconnected, and having generally two dark brown or black spots *above* the middle. This line has also its duplicate nearer the margin, and there is a black dot in the space between the terminations of the nervures at the base of the cilia which are spotted with brown. Specimens are by no means uniform, but vary in the degree of intensity of all the brown markings, and to some extent in the number of black spots.

Biundularia—emerging in the south, generally in May—may be described in *precisely the same terms*, except that the brown scales are very much fewer, and all the brown markings paler, so that the black spots are more noticeable, but it is quite impossible to find any reliable mark constituting a distinction between them. Every spot, shade, line, and blotch is placed precisely in the same position and proportion, and, under a lens of low power, even the dusting of brown scales differs in nothing but degree.

In the hill districts of the midland and northern counties we come upon quite a different set of forms, but all, or nearly all, seem to agree in this one respect, that the tinge of warm fulvous-brown has disappeared, and is replaced by umber, or, more frequently, by various shades of grey, and in very many the grey becomes so dark as to obscure or even efface nearly all the normal markings. In this last case, however, a narrow space between two of the hindermost dark bands remains pale or even whitish, constituting a character never observable in the normal forms. These more northern specimens are generally a little smaller than those from the south, and the costa is usually a little straighter, causing the fore-wings to be slightly narrower, so that there would actually be less difficulty in finding characters to separate the midland hill-frequenting forms from those of the south of England, than in differentiating the two southern forms from each other as we have been in the habit of doing. Nobody, however, supposes that there is any ground for doing this, and a careful examination of the different midland forms seems to show that in their variations, according to times of emergence, they do not follow the southern rule. In my own recent visit to Staffordshire I took but one specimen—just out of pupa on June 11th—which, from its time of emergence, should have been *biundularia*, but which actually agreed far better with *crepuscularia*, only differing in the umbreous instead of fulvous character of the brown markings. On June 19th, the Rev. C. W. Thornewill, of Burton, also took a brown-lined specimen, very similar, and these two are the nearest to the southern *crepuscularia* of any midland specimens that I have seen. But previously to this, on May 29th, Mr. Thornewill had taken one whitish and two grey specimens—veritable *biundularia*. Then again the specimens mentioned (*ante*, p. 41) as taken in Derbyshire *in April* were dark grey with the whitish subterminal line, and others taken in the same place *in June*, are, some of them, precisely similar, while others vary, darker and paler, some being nearly as brown as the Staffordshire specimens.

Many years ago I, with some difficulty, obtained eggs from specimens of *biundularia* taken at Haslemere, in order that Mr. Buckler might compare and ascertain their points of distinction from those of *crepuscularia*. The larvæ were reared and figured, but Mr. Buckler was so little satisfied with the result that just before his lamented death he was desirous of again rearing both forms from the egg, in the hope of finding characters previously overlooked—a most unlikely result.

Taking all these facts into consideration, it seems to me unreasonable to attempt to keep up the purely artificial distinction between these two forms. They should surely be united under the name of *crepuscularia*, W. V.

If we admit that these forms constitute but one species, we are still confronted by the remarkable phenomenon, for which no reasonable explanation seems to present itself, that two races exist in the same localities, emerging at different periods, and presenting a constant difference in the shade of colour. We know that the *biundularia* which emerge in May, are not the offspring of the April *crepuscularia*, and, as far as investigation has gone, we find that the offspring of each form emerges at the same time as its parents, and presents the same characteristics—setting aside the few which feed up quickly and emerge the same season, and exhibit similar characters in a modified form. We have, in fact, a curious instance of dimorphism in both sexes.—CHAS. G. BARRETT, 68, Camberwell Grove, S.E.: *July 22nd*, 1886.

Cidaria immanata: variety of the larva.—On August 25th, 1885, Mr. C. G. Barrett sent me from Belfast eggs of this species; I kept them through the winter out-of-doors on growing moss in a flower pot, and at the end of March, 1886, I found four larvæ just hatched; the rest died in the egg; the first of the four larvæ spun up on 18th May, the last on 5th June; the first moth appeared 11th June, the fourth 26th June; all through, these examples agreed with previous descriptions, except in one particular; one of the larvæ as it grew large showed a *subspiracular* *purplish-pink stripe*; this was not so deep in tint or so wide in extent as I have often seen it in examples of *russata*, still it was very plain, and caused me some surprise, because it had never been before recorded in this species out of the large numbers of larvæ which have been reared.—J. HELLINS, *August* 10*th*, 1886.

Papilio Machaon at Herne Bay.—A specimen of this butterfly in fair condition was captured by myself last week between Herne Bay and Whitstable; a record of this may perhaps interest some of the Lepidopterists.—MARTIN JACOBY, Herne Bay: *August* 16*th*, 1886.

Notes on the life-history of Scotosia undulata and Hypsipetes impluviata.—*Scotosia undulata*:—Having found the larva of this species during the last two or three seasons, I am able to detail a little of its life-history, which, perhaps, is not generally known. The description of the larva given in the "Manual," though brief, is essentially correct. In consequence of the great beauty of single specimens, which I had from time to time casually bred, I was induced to make a special search for larvæ in 1884, and I am glad to say the search was so far successful, that I managed to secure sufficient larvæ to enable me to rear a nice series of about a score. Those who have not yet found the larvæ where the species occurs may do so with little trouble. At the end of August or beginning of September, according to the apparent lateness or earliness of the season, the larva is about one-third or more grown, and is then to be found feeding in a silken web on the upper surface of leaves of sallow. It feeds within this network, and only quits it when the leaf is nearly consumed, nothing but the principal veins, the midrib, and petiole or leaf-stalk being left. Sometimes, and, indeed, most frequently, immediately after a meal it fills up the space occupied by the portion of the leaf just consumed with silken webs. Several leaves are treated in this way, so that the larva is by no means difficult to find. As the larva advances in size, and invariably after the last moult, it is even easier to detect, as it then spins two or three leaves together. It now feeds principally upon the apical portions of the leaves it has spun up, but, so far as I have observed, allows the end of its habitation to remain perfectly open. The larva is always sluggish, and is full-grown here about the middle of September, when it descends below the moss to the surface of the soil, where it constructs a cocoon of earth and silk, pupates and emerges at the end of the following June.

Hypsipetes impluviata:—I have reason to believe that the larva of this species shows a decided preference for the *withered* leaves of alder, upon which it feeds. Probably it prepares its food by biting through or partially through the leaf-stalk, thus causing the leaf to decay.—EDWARD A. ATMORE, King's Lynn, Norfolk: *August* 13*th*, 1886.

Note on the larva of Zelleria hepariella.—While searching for the larva of *Gracilaria semifascia* at Box Hill the beginning of this month, I noticed, by the side of the maple I was examining, a small ash tree, on one of the leaves of which was a white silky cocoon. Putting this into a tin box and continuing my search, I succeeded, after some considerable time, in finding five more pupæ and several larvæ. Thinking it very probable they were the larvæ of *Z. hepariella* I searched other ash trees in the vicinity, but although I looked very carefully no more were to be found;

I saw many leaves where they had been feeding, but all the larvæ had disappeared, no doubt to pupate in some suitable place, so that I was evidently just too late for them. However, I had sufficient for my purpose, which was to try and breed them and so ascertain what they really were. They all spun up the next day, some on the leaves and some among the rubbish at the bottom of the cage. They all made pure white cocoons very similar to those of a *Swammerdamia.* On the 17th of July the first imago appeared, a most beautiful deep orange coloured-specimen, and two more the following day. I was much pleased to see they were as I had expected, *Zelleria hepariella.*

The larvæ are rather slender, tapering towards each end, of a light transparent green colour, with very dark dorsal line; head yellowish-brown; legs yellow; extremely nervous and timid, dropping from the food at the slightest touch. They feed in the shoots, or tips of the leaves, drawing them together by a slight web and gnawing them into large holes; they are full-fed the end of June, the imago appearing the middle of July.—GEO. ELISHA, 122, Shepherdess Walk, City Road, N.: *July* 19*th*, 1886.

Zelleria hepariella.—This insect was bred by me more than a third of a century ago, and it is only now that I begin to suspect where I obtained the cocoon whence the moth emerged on the 27th July, 1852. The fact that I had bred the species was noted by me in the "Entomologist's Companion," 2nd Edition, p. 60, and in the "Insecta Britannica; Lepidoptera Tineina," p. 192, where I remarked of the only three species of the genus then known (*hepariella*, *insignipennella* and *fasciapennella*); "the larvæ of none of them are known, though (to my shame be it said) I have myself bred *hepariella*, but have no recollection of the larva; in the cage in which I bred it was an *ash*-leaf, that had evidently *been eaten*; it emerged from its thick white cocoon on the 27th July, 1852 (the day on which Prof. Zeller finished his visit to England)." I also recorded this same event in the 11th vol. of the "Natural History of the Tineina," p. 94, but it always remained a mystery.

Professor Zeller was 15 days in England in July, 1852, and was naturally eager to see as many of our collecting localities as possible in the short time he was here; we went to Charlton sand-pit, to West Wickham Wood, to Mickleham and to Sanderstead.

We were at Mickleham on the 18th July, and I have now no doubt the ash-leaf, with the white cocoon, which produced so unexpectedly *Zelleria hepariella*, was picked then and there.

Guided by Mr. Elisha's experience, recorded above, a ray of light has dawned upon me, and the locality (hitherto a *terra incognita*) for my ash-leaf seems revealed.

The cocoon may be compared either with that of a *Swammerdamia* or that of an *Argyresthia*; in all the three genera the larvæ spin thick white cocoons.—H. T. STAINTON, Mountsfield, Lewisham, S.E.: *August* 10*th*, 1886.

Description of the larva of Gelechia vilella, Zell.—In the Ent. Mo. Mag. for February last (vol. xxii, p. 212) I recorded the breeding of *Gelechia vilella*, Z., in 1870, from larvæ collected full-fed on the Essex coast in the July of that year. I am now able to give some account of the young larva and its mode of feeding.

Early in June the unexpanded flower buds of the common mallow were found to be tenanted by a very small white larva. A bagful of these buds was thereupon collected, and in a short space of time hundreds of minute larvæ appeared, escaping by burrowing through the linen bag. A few, which were already full grown, and had spun up within the bag, were found to have been devoured by these hosts of voracious youngsters. At the beginning of July however, on revisiting the locality, I observed the full-fed larvæ crawling about in numbers on the fences and walls; collected at this stage they soon pupated and produced the imago in due course.

The young larva of *vilella* is white, with the usual spots small and indistinct; it narrows off very rapidly towards the tail, but has the head and anterior segments remarkably broad. The head itself and the 2nd segment are shining black; *the 3rd segment is bright chestnut-red.* As the larva approaches maturity, the ground-colour becomes pinkish, and when full-fed deep, dull pink, while the bright red of the 3rd segment fades, until it is scarcely perceptibly darker than the rest of the body. The spots are then large and brownish. Feeding when young in the flowers and unopened flower-buds, but afterwards in the unripe seeds of the mallow; when full-fed leaving the food-plant and spinning up among rubbish in a slight, but strong, white cocoon. Before doing this, the larvæ wander a long distance and often ascend the walls of houses, where they apparently pupate under the shelter of the eaves. In confinement I find they spin up readily in the inside of sheets of wool. The pupa is light brown, and, *at first*, very tender. As in many places the mallow plants are almost entirely stripped of flowers and seeds by the extraordinay multitude of feeding larvæ, this wandering propensity observable in those about to pupate may be due to an instinctive desire to escape from the cannibal jaws of their still hungry juniors. The imago appears very sluggish, sitting close on the ground, and refusing to fly when disturbed.

It may be worth while to note the points of similarity and difference between this species and *malvella*. The imagos are both of the same size and build, the same dull brown colour, the same sluggish retiring habits. *Vilella* may be distinguished by the small black spot near the base of the inner margin; *malvella* by the dark fascia towards the apex. The larvæ both feed on allied plants, and more or less in the same fashion, eating out the seeds; but while *vilella* feeds in June and July, emerging in August, and hibernating *as imago* lays its eggs in spring, *malvella* feeds up in August and September, hibernates *as larva* in a cocoon, and then, after spinning a fresh cocoon in spring and pupating therein, emerges in July. The larva of *malvella* feeds in nature on *Althæa officinalis*, and in gardens on hollyhocks (*Althæa rosea*); that of *vilella* attacks *Malva sylvestris*.

I should add, that though occurring in the larval state in great profusion, *Gelechia vilella* yet appears to be very local. I can find it for about a mile along the coast, wherever the food-plant grows; but beyond this distance, though the mallow is equally abundant, there is no trace of the larva.—W. Warren, Cambridge: *August 20th*, 1886.

Note on Miridius quadrivirgatus, Costa.—On July 16th, 1884, I found this species in great abundance by sweeping long grass and mixed herbage in a lane bordered by dykes at Deal; it appeared to be very local, about four square yards being the limit; it, however, took flight with great rapidity. On the 3rd of this month I was surprised to sweep it up at Dover, in the mixed herbage at the side of a path leading through a corn field; it, however, was not so common or so local as at Deal. Specimens occurred at a considerable distance from each other. Messrs. Douglas and Scott (British Hemip.-Heterop., p. 301) give the dwarf sallows at Deal as the habitat, but I have not found it near the sallows, and there are no dwarf sallows or any species of sallows on the dry chalky fields on the cliffs of Dover. Is it possible that they may be found on any low growing plant by the sea?—C. G. Hall, Dover: *August 4th*, 1886.

Oxygastra Curtisi, Dale, in Hampshire.—In the September number of this Magazine for 1878 (vol. xv, p. 92), I recorded the capture of six specimens of this dragon-fly on a heath lying to the north of Pokesdown, near Christchurch, Hampshire. I visited the same locality in June, 1882, but saw no specimens of this species. On the 14th inst. I again visited this heath, and found four specimens, all males. The extremely local character of this species is evident from the fact that, except on the heath in question, I have never seen it alive, either in this neighbourhood or elsewhere in the United Kingdom; nor has either Mr. Kemp-Welch or Mr. McRae, of this town, ever met with the species, although they are well acquainted with the district, and have collected in it for some years past insects of all Orders.—H. Goss, Bournemouth: *July 28th*, 1886.

The genus Dilar in France.—In the first half of July in this year I was the guest of M. René Oberthür, at his charming chalet at Vernet-les-Bains, in the Pyrénées Orientales. It was my first introduction to a district almost Spanish, both in productions and position. The detailed results in *Neuroptera* I hope to publish hereafter. The 12th and 13th of the month were devoted to a long and sufficiently arduous excursion to Mount Canigou, near the summit of which we enjoyed (?) a few hours rest in a stone cabin. The descent was commenced at about 5 a.m. on the 13th, and, in consequence of entomological vagaries (opposed to the steady marching of mere alpine climbers), Vernet was not reached till late in the afternoon, and one of us was very sleepy. At a locality known locally as the "Col du Cheval Mort," which is hot, arid, and argillaceous, I "bottled" a Neuropterous insect at rest on a leaf of *Asclepias vincetoxicum.* I did not recognise it, even generically, at the time, but it proved to be a ♂ *Dilar*, which I identify as *D. meridionalis*, Hagen, and of which I possess specimens from San Ildefonso (Old Castile) in Spain, given me by Mr. Albarda, a very interesting addition to the French fauna, and interesting, also, as throwing light upon the geographical distribution of the genus *Dilar*. I have been precise in narrating the circumstances of the capture; the habits of *Dilar* are unknown. But my suspicions lie in the direction of the larva being parasitic in the nests of some insect, in consequence of the long and slender ovipositor of the ♀. This can only be solved by local observation.—R. McLachlan, Lewisham, London: *August 11th*, 1886.

Ascalaphus hispanicus, Rambur, in France.—This is another interesting addition to the French fauna. I did not meet with it myself, but a pair (♂ ♀) were taken by M. Oberthür at quite the end of June, at St. Martin de Canigou (Pyrénées Orientales) in company with *A. coccajus.* The last-named species, and *A. longicornis*, are abundant near Vernet, but not together. Four species of true (restricted) *Ascalaphus* are now known to inhabit France, viz.:—*A. coccajus, longicornis, ictericus*, and *hispanicus*, and as *A. bœticus* is known from Catalonia, its discovery in the Pyrénées Orientales may be looked upon as almost certain.—Id.

Note on Phyllotreta melæna, Ill.—Phyllotreta melæna has been extremely destructive in this neighbourhood during the present year. I first noticed it towards the end of March, when a few specimens were resting upon the leaves of autumn-sown cabbages which had passed through the winter. To these it did little or no damage, as the plants were sufficiently large and strong to bid defiance to its attacks. But a fortnight or so later, when the first spring sowing of cabbages began to appear above the ground, the beetle increased greatly in numbers, and from that time until the day upon which I write, I have seldom passed through the garden without noticing it in abundance.

The damage which it has caused has been very considerable; throughout almost the whole of the surrounding district the first-sown cabbages, brocoli, and cauliflowers were more or less severely injured, and in some cases completely destroyed. In our own garden, perhaps some twenty plants survived out of eight or ten rows. Later on the seedling kale was attacked in a similar manner, the leaves being riddled as though a heavy charge of small shot had been fired through them, and successional sowings of other brassicas have also been greatly injured, although in a less degree. At the present moment the beetle is as abundant as ever, even upon hearting cabbages.

With regard to *Ph. nemorum*, Curtis states that there may be five or six broods in a season. *Ph. melæna*, to judge by my own observations, seems to follow no rule upon the subject, but breeds continuously, without reference to regularity. I do not think that I have once examined the infested plants without noticing a number of pairs *in copulâ*; and certainly the beetle has never disappeared from the garden, even for a couple of days together.

A professional gardener of some local celebrity tells me that the insect in question is also destructive to broad beans. This, however, I cannot believe. I have had beans and cabbages growing in alternate rows upon the same plot of ground, and a most careful search, repeated upon more than one occasion, has resulted in the discovery of two specimens only upon the former; and these, no doubt, were accidental visitors only, which had sprung from their food-plant at the vibration of an approaching footstep. And the leaves of the beans show no traces of the "riddling" which is so conspicuous in the cabbages. I rather fancy that the gardener in question, unobservant after the manner of his race, has confused the *Phyllotreta* with *Sitones lineatus*; a strange mistake, perhaps, but one of far less magnitude than many which are prevalent among the agricultural classes.

It is perhaps scarcely necessary to say, that only the young plants are seriously injured by the beetle; these, however, are frequently destroyed while still in the seed-leaf. At least one-third of the cabbages, kale, &c., sown in the garden this year have thus been killed, and I have reason to believe that others in the neighbourhood have suffered more severely than myself. I do not think that *Ph. melæna* is generally abundant; I have never taken it in any numbers elsewhere. But in this neighbourhood it is certainly by far the most plentiful and mischievous species of the genus.—THEODORE WOOD, St. Peter's, Kent: *June 28th*, 1886.

Langelandia anophthalma, Aubé, at St. Peter's, Kent; a species of Coleoptera new to Britain.—I have great pleasure in recording the capture of this most interesting addition to our Coleopterous fauna, having taken some twenty examples in the garden here from decaying seed-potatoes. I first met with the insect, then quite unknown to me, in May, and am still taking it occasionally at the date of writing.

It has been suggested to me that the beetle may possibly have been imported with foreign grown potatoes, and so be a semi-naturalized foreigner rather than an indigenous species. On making enquiries, I find that the seed in which the greater number of specimens have occurred came from Guernsey—a fact which seems rather to favour that supposition. But, on the other hand, I have taken several examples from potatoes raised by myself last year from English seed, and accidently left in the ground during the winter; and, as the first of these occurred early in May, barely a month after the Guernsey seed was planted, and at a distance, moreover, of some twenty feet away, there can be little doubt that the beetle was present in the ground before the potatoes.

Upon the Continent, *Langelandia* seems to be generally taken in buried logs, or beneath boards, &c., lying upon the ground. Du Val, in his "Genera des coléoptères d'Europe," says of it:—On le trouve principalement sur les pièces de bois plantées dans le sol, ou sous les vieux tonneaux, les vieilles planches, &c., placés depuis longtemps dans les jardins." But I am convinced that it would be found far more plentifully in decaying seed-potatoes if carefully searched for at the time of lifting the crop; and it is more than probable that other captures of interest would be made at the same time. So far, I have taken in this manner three or four hundred specimens of *Adelops*, fifty or sixty of *Anommatus*, and twenty of *Langelandia*, besides such species as *Falagria thoracica* and *Oxytelus insecatus* in greater or less abundance.

The most productive seed is that which is partly decayed only, and which is moist without being wet; potatoes reduced, as often happens, to a semi-liquid pulp will yield little or nothing. Great care, however, is always necessary in the examination, for both *Anommatus* and *Langelandia* are exceedingly sluggish, and harmonize in colour so well with their surroundings that they might well be passed by unnoticed.

In form and size *Langelandia*, although a member of the *Lathridiidæ*, is very similar to *Ditoma crenata*, from which it can be at once distinguished by the three bold ridges which run longitudinally along the thorax and elytra, by the uniform dull reddish-brown colour, and by the total absence of eyes. It can scarcely be confounded with any other British species, and any collector fortunate enough to meet with the insect will find little difficulty in identifying his capture.—ID.: *August 9th*, 1886.

On the British species of the genus Agenia, Schiödte.—Hitherto our list of British *Hymenoptera Aculeata* has included only two species of *Agenia* with banded wings, viz.: *variegata*, Linn., and *bifasciata*, Fab., whereas on the continent two other species occur, *hircana*, Fab., and *intermedia*, Dahlb. Until quite lately, I never had any doubt as to our British species being correctly named, they were easily distinguishable, the ♀ of *bifasciata* having the metathorax punctured, while that of *variegata* was transversely rugose, but during last month, Mr. R. C. L. Perkins, of Sopworth, near Chippenham, captured several of an *Agenia* with punctate metathorax, of which he has sent me specimens, which certainly neither agree with the description given by Dahlbom or Thomson of *bifasciata*, nor with the ♀ of that species which I possess myself, and from which I drew up the description in my synopsis. I think it is also certain that they are referable to *hircana*, Fab., as described by Dahlbom and Thomson. The male may be known by the shape of the apical ventral segment of the abdomen, which is much compressed laterally, as in *variegata*, but looked at sideways is somewhat hatchet-shaped, its base depending almost perpendicularly from the level of the preceding segment. The ♀ may be known by its shining metathorax, and its small size, which is rather less than that of *variegata*.

The question which arises now is, have we three species indigenous to this country, or only two; from what I can see, I am inclined to think that both Shuckard and Smith have described *hircana* under the name *bifasciata*. Dahlbom (Hym. Eur., i, p. 83) refers Shuckard's *bifasciata* to his *hircana*, without doubt, and, from the size given, and the mention of the shining metathorax, I have no doubt he is right: and for the same reasons I believe that Smith's *bifasciata* is referable to *hircana* also.

If we thus dispose of *bifasciata*, of Shuckard and Smith, as a synonym of *hircana*, Fab., I am afraid the claim of the true *bifasciata*, Linn., to a place in our list will rest on my own single female: this specimen came from my father's collection, and bears the small blue ticket, by which he always indicated his British specimens; there is no note of locality, and in a general collection like his, where British, continental, and exotic species were all together in one arrangement, one cannot but foresee the possibility of a ticket being detached from the pin of an English specimen, and accidentally attached to another's, perhaps of continental origin; so that, although I much regret it, I think we must wait for further evidence to accept *bifasciata* as a British species, and be content at present with *hircana*, Fab., = *bifasciata*, Shuck., Smith, and *variegata*, Linn. It is quite likely, however, that *bifasciata* may turn up, as it occurs in Sweden, in Germany, in Belgium, and in France.---EDWARD SAUNDERS, St. Ann's, Mason's Hill, Bromley, Kent: *July* 12*th*, 1886.

Reviews.

FOURTH REPORT OF THE UNITED STATES ENTOMOLOGICAL COMMISSION. The COTTON WORM, together with a chapter on the BOLL WORM. By CHARLES V. RILEY, Ph.D.; Washington, Government Printing Office. Pp. xxxviii and 399; Appendices and Index, pp. 147, with numerous engravings, two maps, and 64 plates, 8vo, 1885.

That Prof. Riley is "nothing if not thorough" goes without saying. The Report is a masterly monograph, classificational, bibliographical, anatomical, and agricultural. We might, from a reviewer's point of view, complain of its bulk, but those specially interested must endeavour to apply themselves to the particular portion that concerns them. The "Cotton Worm" (which it appears should bear the name *Aletia xylina*, Say) occupies fifteen of the sixteen chapters, chap. 17 being devoted to the "Boll Worm" (*Heliothis armigera;* also a Cotton Worm); the Appendices mainly concern Reports from various assistants, and extend to Brazil, Central America, and the West Indies. Most of the chapters are from Prof. Riley's own pen; but chap. 5, devoted to anatomy, is by E. Burgess and C. S. Minot; chap. 6, on "the Cotton Belt," by Prof. E. A. Smith; and chaps. 11–13, on machinery, &c., devised for distributing destructive agents, are by Prof. W. S. Barnard, and the plates from 14 inclusive concern the same subject. The two folded maps are respectively explanatory of the physical conditions of the area occupied by cotton cultivation in the States, and of the proportion that cotton bears to other crops. The chapters treating on destructive agents, which are mostly "Paris Green," "London Purple," Kerosene, and *Pyrethrum*, should be consulted by all interested in Economic Entomology in all countries, and for nearly all crops. It is the duty of a physician to cure disease or to prolong life; so also is it the duty of an economic entomologist to endeavour to save the crops of the agriculturist from attacks of insect-enemies. We leave the question of over-production to the consideration of the political economist.

SECOND REPORT ON THE INJURIOUS AND OTHER INSECTS of the State of New York. By J. A. LINTNER, State Entomologist. Albany, 1885, 8vo, pp. 262.

We like this Report. If less bulky than those issued for some others of the States it has the merit of clearness, and absence from a superfluity of red-tape matter of little interest to the general reader; nevertheless, the subjects treated upon are very numerous, so numerous that we cannot even mention them in a condensed form; and all are treated upon in a practical, as well as in a scientific manner. The author is an unrelenting enemy of the English sparrow, which he condemns as being one cause of the increase of caterpillars, because it drives away the native birds that feed upon them, and does not perform that useful office itself. The illustrations are characteristic, but there is a coarseness about some of them. The index is very full. A useful feature is a reprint of a scarce paper by the late Asa Fitch who so long held the position of State Entomologist for New York.

THE LEPIDOPTERA OF DORSETSHIRE, or a Catalogue of the Butterflies and Moths found in the County of Dorset. By C. W. DALE. Dorchester, Henry Ling; London, Trübner and Co. Pp. xiv and 90, 8vo, 1886.

This is, probably, one of the most complete lists of its kind that exists, and so it should be, the name of Dale having been so intimately connected with the Entomology of the County of Dorset for two generations, and for nearly the whole of the present century, and latterly the author has had valuable assistance from the Rev. O. P. Cambridge, the Rev. C. R. Digby, Mr. E. R. Bankes, &c. Taking the number of British species at 2095, 1302 are enumerated as having been found in the County, a very large proportion. An appendix is devoted to notable species in other orders that have been recorded from the County, which is divided into six divisions on account of physical and other features. The short introduction is readable, but, perhaps, the first paragraph might have been advantageously omitted. The work is of antiquarian interest from an entomological point of view. We read that *Papilio Machaon* (formerly plentiful) has not been taken at Glanville's Wootton since 1816; *Apatura Iris* not since 1840; *Vanessa c-album* not since 1816; *Melitæa Artemis* not since 1841 ; *Lycæna Acis* not since 1839 ; and so on. The book is nicely got up, and is comparatively free from typographical errors. Probably no other County can boast of having possessed a resident entomologist who commenced his diary in 1808, and continued it until the day of his death in 1872 ; such was the case with the late Mr. J. C. Dale.

ENTOMOLOGICAL SOCIETY OF LONDON, *August 4th*, 1886: Prof. J. O. WESTWOOD, M.A., F.L.S., Hon. Life-President, in the Chair.

The following were elected Fellows, viz. :— Lord Dormer, Mr. J. H. A. Jenner, Mr. James Edwards, Mr. Morris Young (formerly Subscribers), Mr. F. V. Theobald, of St. Leonards-on-Sea, Mr. E. A. Atmore, of King's Lynn, Norfolk, and Mr. William Saunders, of London, Ontario, Canada, President of the Entomological Society of Ontario.

Mr. Theodore Wood exhibited and made remarks on the following *Coleoptera*, viz. :—An abnormal specimen of *Apion pallipes* (Kirby), with a tooth upon the right posterior femur ; a series of *Langelandia anophthalma* (Aubé) from St. Peter's, Kent, taken in decaying seed potatoes ; a series of *Adelops Wollastoni* (Janson), and *Anommatus 12-striatus* (Müll.), also from decaying seed potatoes ; and a series of *Barypeithes pellucidus* (Boh.), from the sea-shore near Margate. Mr. Wood also exhibited, on behalf of Dr. Ellis, of Liverpool, a specimen of *Apion annulipes* (Wenck.).

Prof. Westwood exhibited five specimens of a species of *Culex*, supposed to be either *C. cantans* or *C. lateralis*, sent to him by Mr. Douglas, who had received them from the Kent Water Works. It was stated that they had been very numerous in July last, and that persons bitten by them had suffered from "terrible swellings." Prof. Westwood also exhibited galls found inside an acorn at Cannes in January last.

Mr. Billups exhibited a male and female of *Cleptes nitidula* (Latr.), taken *in copulâ* in July last, at Benfleet, Essex, on the flowers of *Heracleum sphondylium*. He stated that it was probably the rarest of the twenty-two known species of British *Chrysididæ* ; it had been recorded from the New Forest and from Suffolk. Prof. Westwood, the Rev. W. W. Fowler, Mr. Fitch, and Mr. Champion, made some remarks on the species.

The Rev. W. W. Fowler announced that a series of specimens of *Homalium rugulipenne* (Rye) had been received from Dr. Ellis, of Liverpool, for distribution amongst members of the Society.

Mr. White exhibited a group of three specimens of *Lucanus cervus*, consisting of a female and two males. The female was *in copulâ* with one of the males, which, while so engaged, was attacked by the second male.

Mr. E. A. Fitch read a paper, communicated by Mr. G. Bowdler Buckton, "On the occurrence in Britain of some undescribed *Aphides*." The paper was illustrated by coloured drawings.

Prof. Westwood read a paper "On a tube-making Homopterous insect from Ceylon."

Mr. Theodore Wood read a paper "On *Bruchus*-infested Beans." A discussion ensued, in which Prof. Westwood, the Rev. W. W. Fowler, Messrs. Weir, Fitch, Trimen, and others took part.—H. GOSS, *Secretary*.

SOME NEW FACTS CONCERNING *ERISTALIS TENAX*.

BY C. R. OSTEN-SACKEN, HON. F.E.S.

In the Trans. Ent. Soc. Lond., 1884, p. 489, I called attention to the sudden appearance of *Eristalis tenax* in all parts of the United States. Till 1875 this fly was not known to occur in North America; two years later it was common in Boston; it is now called "common" and "very common" in local lists from Montreal, Canada (Caulfield, Can. Ent., 1884, p. 138), and Philadelphia (E. L. Keen, *l. c.*, p. 146), and it has been received from all parts of the United States, including California, New Mexico, Oregon, and Washington Territory.

Two explanations of this sudden invasion were possible (I quote from my article): "*E. tenax* may have been imported from Europe in ships to one of the harbours of the Atlantic. But if this importation happened long ago, it would have been noticed earlier; if it has taken place recently, it leaves unexplained the almost simultaneous appearance of the fly in Georgia, Missouri, Illinois, and even on the Pacific coast. The other possible explanation is, that *E. tenax*, like some other European species (*Syrphus pyrastri*, for instance), was indigenous on the western side of the continent only, and that it began to spread eastward since civilization in its westward progress came in contact with the area of its occurrence. . . . *E. tenax* may have reached Missouri and Illinois years ago without being noticed; it attracted attention as soon as it appeared on the Atlantic coast, where Dipterologists could recognise it."

Soon after the publication of my paper, I came into possession of a fact which confirms the second of the two hypotheses, the immigration of *E. tenax* from the west. The American Dipterologist, Dr. S. W. Williston, of New Haven, wrote me "that he had seen a specimen of *E. tenax* hidden among a lot of duplicates in Prof. Riley's collection, bearing a label St. Louis, August, 1870;" he added, "that upon drawing Prof. Riley's attention to the fly (which the latter did not previously know by name), he was assured that the species had long been familiar to him about outhouses in St. Louis."

The surprising rapidity with which *E. tenax* spread along the Atlantic coast soon after its first appearance renders it probable that it cannot have existed in St. Louis very long before 1870; otherwise, it would have reached the Atlantic sooner. We are thus driven to accept the following outline of its history. We know that it exists in Japan and Eastern Siberia; from there it must have immigrated into the North American Pacific coast, perhaps long ago. It did not spread eastwards at once, because the necessary conditions for its existence were wanting on the immense plains it had to cross, just as the Colorado beetle lived in the Rocky Mountains on *Solanum rostratum*, and did not spread eastwards until civilization brought the potato plant (*Solanum tuberosum*), and thus bridged over for that beetle the distance between its native mountains and the Atlantic coast. The condition which civilization brought and which favoured the rapid eastward progress of *E. tenax* consisted in the drains, sewers, and cesspools, those necessary concomitants of crowded centres, and the usual abodes of the larvæ of *Eristalis*.

If we accept this train of reasoning, and I do not see any escape from it, we must carry it further, and admit that *E. tenax* is a companion of civilization, and becomes common with its diffusion only. In early times, when there were no drains and cesspools, *E. tenax* must have been much less common. We have a parallel case in the gradual diffusion of *Teichomyza fusca*, which became common in cities with the introduction of certain modern improvements in cleanliness (compare its history in the paper by Dr. Laboulbène, Ann. Soc. Ent. Fr., 1867, p. 33).

At this point another, apparently very distinct subject, forces itself upon our attention. It is well known that the ancients believed that carcasses of dead animals (especially oxen) produced *bees*. Virgil, in the Georgics (iv, 285) speaks about it; even modern authors like Aldrovandi (De Anim. Insectis, p. 58, edit. 1602) and Moufet (Theatr. Insect., p. 12, 1634) relate the most wonderful stories: "Aiunt ex horum cerebro gigni reges et duces, ex carnibus vero apum vulgus. Nascuntur item reges ex medulla spinæ, tamen ex cerebro nati pulchritudine, magnitudine, prudentia et robore aliis antecellunt, etc." (Moufet, *l. c.**). Lion's carcasses are also spoken of, and the passage in the Book of Judges xiv, 8, refers to a similar case: "And he (Samson) turned aside to see the carcass of the lion; and behold, there was a swarm of bees in the body of the lion, and honey," etc., the honey, of course, being a stretch of imagination.

Now, in all these cases, what were mistaken for bees must have been species of *Eristalis*. Even nowadays *E. tenax* is frequently taken for a bee by non-entomologists. Such occurrences are less familiar to us than to our forefathers, because carcasses are not left lying about now as they were before. But a case in point has been observed by Zetterstedt in Lapland (Dipt. Scand., ii, p. 666). He saw *Eristalis anthophorinus* swarming round the carcass of a sheep: "Ad cadaver ovis putridissimum, aquæ stagnanti maximam partem immersum odore fœtidissimum, individua 7 vel 8 feminea sono pipiente celerrime circumvolando congregantia et in cadaveris parte supra aquam elevata interdum sedentia die 16 Junii in Lapponia observavi, ova in cadavere sine dubio depositura." The presence of a pool of putrid water is probably an indispensable condition for the development of the larvæ in such cases.

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* Chap. iii, "De creatione, generatione, et propagatione Apum."

I do not know whether this explanation of the antique superstition has been offered before. My friend, Geo. H. Bryan, Esq., B.A., in Cambridge, published it, upon my communication, in Science Gossip, Nov., 1885, p. 242.

As to the diffusion of *E. tenax* over the American continent, two principal results must be kept in view: first, that it took place *overland*, and that this fly was not carried across the Atlantic during four centuries of intercourse (it will be interesting in this respect to watch whether it will ever be imported into distant islands, like New Zealand, St. Helena, &c.); secondly, the incredible rapidity with which it spread over the Atlantic States, as soon as it found access to the conditions necessary for its larval existence.

Heidelberg: *August*, 1886.

A LUMINOUS INSECT LARVA IN NEW ZEALAND.

BY G. V. HUDSON.

Referring to your request for further information on the luminous larva mentioned in Mr. E. Meyrick's paper, which appeared in the April number of your Magazine (*cf.* Vol. xxii, p. 266), I have much pleasure in forwarding you a brief account of my observations on the insect, which, although not so exhaustive as might be desired in a case like this, are quite sufficient to corroborate your surmises at the conclusion of his paper.

This larva, as Mr. Meyrick remarks, may be found in damp, overgrown gullies, where it is tolerably common, in fact, I have noticed as many as a dozen at a time, but never in such numbers as Mr. Meyrick alludes to; indeed, such a sight would be absolutely dazzling, as the light from a single individual kept in a caterpillar-cage may be seen streaming out of the ventilators at a distance of several feet. When carefully examined with a pocket-lens, this light is found to proceed from a large glutinous knob situated at the *posterior* extremity of the larva, a fact I have verified by repeated investigations. The insect inhabits irregular cavities in the bank, where it hangs suspended in a glutinous web, which also appears to envelope its body, large quantities of sticky mucus being periodically shot out of the mouth and formed into threads as required, but I have never seen anything like a net extended in front of the insect, neither have I found flies or gnats detained in the webs, although I have examined a large number. At the back of this irregular chamber the larva constructs a small hole, into which it retreats with great rapidity when alarmed. With regard to its food, I am unable to speak with absolute certainty at present, but have little doubt that it consists of decaying vegetable matter. One individual I kept alive for eight weeks was enclosed in a small jar of mud taken from its native bank and placed in a caterpillar-cage where no flies or other small insects could possibly be obtained; as, however, there were some small earthworms in the mud it might have subsisted on these; although I examined the insect nearly every night and morning, I never saw it eat anything.

The light is not shown by any means regularly. On several occasions there was no light all the evening, and then a brilliant display at four or five o'clock in the morning, but I have not noticed any peculiar meteorological conditions to influence this. I do do not think Mr. Meyrick's explanation of its use can be entertained, as I am sure every one who has attracted insects at night will know how inadequate such a minute point of light would be to fetch them from any distance. If I might be allowed to suggest a use, I think it may often assist the larvæ in escaping from enemies, as when disturbed they nearly always gleam very brilliantly for a few seconds afterwards, suddenly shutting off the light and retreating into the earth. Of the pupa-state I am quite ignorant, as I have only reared a single specimen, which I unfortunately did not observe while in that condition; but, with respect to the imago, I may say with the fullest confidence that it has no manner of relationship to the *Staphylinidæ* or indeed to any other Coleopterous family, being, in fact, a small "gnat," apparently one of the *Tipulidæ*, and, as it is perhaps undescribed, I forward the specimen for examination by a systematic Dipterist. Why it has been regarded as Coleopterous I cannot understand, as it does not materially differ from numerous other Tipulidous larvæ abounding in rotton wood, etc., throughout the country.

Ghuznee Street, Wellington, N.Z.:
July 15*th*, 1886.

[Mr. Hudson is correct as to the systematic position of the insect he has forwarded. We submitted it to Baron Osten-Sacken, who kindly informs us that it is a Limnobid of the genus *Trimicra*, O.-S. The genus is cosmopolitan; it has already been received from New Zealand. There is a notable discrepancy in the two accounts. Mr. Meyrick says the light proceeds from "the back of the neck," Mr. Hudson from the "posterior extremity." We earnestly ask for specimens of the larva preserved in alcohol, or mounted in balsam as a microscopic slide. In connection with luminous *Diptera*, we call attention to Baron Osten-Sacken's notes in Ent. Mo. Mag., xv., p. 43.—EDITORS.]

ON THE PRETTY NEW SPECIES OF *GELECHIA* (*NANNODIA*), ALLIED TO *NÆVIFERELLA* (*STIPELLA*, HÜBNER), WHICH IS ATTACHED TO *SILENE NUTANS*.

BY H. T. STAINTON, F.R.S.

Most of my readers who have worked at all at the larvæ of the *Micro-Lepidoptera* are familiar with the beautifully white blotch-mines in the leaves of *Atriplex* and *Chenopodium*, caused by the larvæ of *Gelechia (Nannodia) næviferella*, and those who have bred that species know well how little can an idea of the species be formed by those who know it only from specimens captured on the wing.

The insect is liable to considerable variation; and a form which seems not uncommon in Germany, to which Hübner gave the name of *stipella*, is at a first glance so strikingly different, that it is hardly a subject for wonder that for long it was considered as a distinct species from the ordinary, more sober-looking form of *næviferella*. *Stipella* differs from *næviferella* in having a broad yellow fascia a little distance from the base, and a large yellow spot on the inner margin beyond the middle, and a large yellow spot beyond it just below the pale costal spot of *næviferella*.

Of this form I do not seem to possess any British representative, but, on the other hand, I have three specimens of *næviferella*, with the entire inner margin yellow from very near the base to the anal angle —of this form I have, so far, seen no representative amongst the specimens I have at various times received from the continent.

A few years ago, my friend Herr Eppelsheim, of Grünstadt, in the Palatinate, met with a new species of *Nannodia*, to which Staudinger has given the name of *Eppelsheimi*, describing it in the Stettiner entom. Zeitung, 1885, p. 351; this insect so resembles the *stipella* form of *næviferella*, that I felt at first doubtful whether it was not really that insect, but a closer examination, and a long series with which its discoverer so liberally provided me, satisfied me that it was quite distinct from *stipella*, and a good species. Though furnished like *stipella* with a broad yellow fascia and two large yellow spots, the form of the dorsal spot is much more contracted, and for this there is an evident reason, as its space is much more restricted, owing to its being preceded and followed by *slender silvery fasciæ* (of these silvery fasciæ we see no trace in *stipella*); beyond the sub-costal spot are also a few silvery scales, but I cannot see in them another fascia. Staudinger also notices as a good character the whiter tips of the hind-marginal cilia.

In striking contrast to *næviferella*, this new *Nannodia* does not seem liable to vary at all, unless it be in size. *Nannodia Eppelsheimi* feeds on *Silene nutans* (the Nottingham catchfly) in the leaves of which plant the larva mines conspicuous white blotches. The larvæ of the first brood may be found in the middle of June, those of the second brood would probably occur in September.

It is quite possible that if those who live where the *Silene nutans* occurs would search for this larva, they might have the pleasure of adding this pretty species to the British Fauna.

Mountsfield, Lewisham:
July 6th, 1886.

NOTES ON HIMALAYAN *LEPIDOPTERA*.

BY CAPT. A. GRAHAME-YOUNG.

Arctia cajula, Staudinger.—As I was the discoverer of this insect, a few particulars supplementing Dr. Staudinger's description (Vol. xxii, p. 258) may not be out of place.

I captured three specimens at Koksur, in Lahoul, in August, 1868, and have found it more or less plentifully on each visit that I have paid to Lahoul. In 1884, I found it in great numbers on broken ground in front of the Koksur rest-house, 10,400 feet above the sea level. I could have captured several hundreds, had I been addicted to promiscuous slaughter; as it was, I captured some 60 or 70, which I forwarded to my correspondent, Captain Elwes, unfortunately there was only one female amongst them.

Captain Elwes is in error as to its range and habitat. It is only found in the zone between 10,000 and 12,000 feet, indeed, its metropolis seems to be a space of 2 miles, between the village of Koksur, exactly 10,000 feet, and the rest-house, 10,400. Koksur is the most easterly village in Lahoul. Outside these limits only a few stragglers are very rarely to be met with. It seems confined to the main valley, not occurring in any of the lateral ravines; only on one occasion did I meet with *A. cajula* as high as 12,000, when I captured a solitary specimen on a grassy plateau, called Kanor Tunka, 17 miles east of Koksur, in August, 1874. It is diurnal in its habits, flying with an undulating flight, between the hours of 7 and 11 in the forenoon, when it drops down into the herbage. The high wind that springs up daily in Lahoul, and blows from noon till sunset, is probably the cause of this.

The larva is abundant in July on dock and sorrel, it is a perfect miniature "woolly-bear," differing in no one respect, save size, from that of *A. caja.*

When full fed it forms a loose cocoon by drawing two or three leaves together, and changes into a bright chestnut pupa. The imago emerges in from 12 to 14 days. The best time for it is from the 1st to the 20th August, when it begins to disappear.

Larva of Aulocera Swaha.—I have during the present year, at last, after many years' hunting, succeeded in discovering the larva of one of the *Aulocerœ*—*A. Swaha.* I found it on the wild blue Iris the first week in August, at about 8000 feet in the upper Parbutti valley, Kulu. The larva seems black, but is so very thickly clothed with short bright yellow hairs, that it is almost impossible to see what its ground colour really is; head and legs black. It attaches itself to the centre of the leaf by the tail, and a bright yellow thread across the pupa, head upwards, like a Lycænid.

The pupa is shining olive-brown above, head, spines and tail, black, a white patch crossed by an irregular black band upon each side of the thorax, a circular yellow spot on each shoulder, on each side of the dorsal segments is an irregular white mark.

I am sending home a dead pupa for exhibition, but the colours, very vivid in the living pupa, fade rapidly upon the death of the insect.

The imago emerges in a fortnight.

For the benefit of such of your readers as may possess Marshall and De Nicéville's "Butterflies of India," I make the following additions to our Kulu lists; at the time that Vol. 1 was published, I had not, for want of specimens, discriminated these species:—

Danaidæ: *Danias Aglea* (one only).

Satyridæ: *Orinoma Damaris, Zophoessa Yama, Rhaphicera Satricus, Mycalesis Lepcha, Callerebia Scanda.*

Kulu, Punjab:
August 16*th*, 1886.

TWO NEW SPECIES OF *CORDULIINA.*

BY ROBERT McLACHLAN, F.R.S., &c.

HEMICORDULIA FIDELIS.

♂. Abdomen, 35 mm. Posterior-wing, 34 mm.

Wings hyaline, the posterior very slightly tinged with yellowish in the basal third: neuration black, the costal vein black externally: pterostigma black, 2 mm.; 7–8 ante-cubital and 6 post-cubital nervules in anterior-wings: membranule cinereous, slightly paler at base.

Face entirely yellow (but the base of the labrum slightly olivaceous), labium and its lobes yellow; top of front, and vesicle, shining metallic-green, slightly chalybeous, bordered with brownish; occiput black. Thorax (much crushed) apparently for the most part yellowish above, but with broad median metallic-green bands (probably densely clothed with cinereous pubescence); sides metallic-green, varied with yellow (or *vice versa*). Abdomen nearly cylindrical, above bronzy-green (scarcely metallic), segments 8—10 black, the 10th slightly yellowish posteriorly: viewed laterally there is a large elongate brown spot on each segment, from 2 to 7, not reaching the posterior margin of the segments, and a vestige at the base of segment 8; beneath, the abdomen is almost wholly brownish-yellow, but with a broad blackish space at the posterior end of each segment. Legs black, the anterior femora wholly, and the intermediate outwardly, brownish: length of posterior tibiæ, 6½ mm.

Appendages wholly black. Superior appendages shorter (3 mm.) than segments 9 and 10 combined; viewed from above, they converge in a triangular manner gradually from base to apex, slightly sinuate externally in the basal half, the apical half thickened, sub-cylindrical, the apex sub-obtuse: viewed laterally, they are cylindrical, curved and rather slender at the base, followed by a *short broad triangular tooth* on the lower edge, after which they become thickened, the sub-obtuse apex slightly acuminate; they are clothed with short black hairs. Inferior appendage scarcely shorter than the superior, very elongately triangular, the apex obtuse and slightly curved upward.

♀ unknown.

Hab.: Uvea, Loyalty Islands (near New Caledonia), 1 ♂ in my collection.

This would appear to be in some respects intermediate between the groups of *H. oceanica* and *H. australiæ*, but more probably belongs to the latter group. The *short triangular tooth* on the lower edge of the superior appendages is a good character. The condition of the thorax in the type prevents exact description of the distribution of the pale and metallic colours.

TETRAGONEURIA CANIS.

♂. Abdomen, 34 mm. Posterior-wing, 32 mm.

Wings hyaline, very faintly smoky: neuration black, the costal vein yellowish externally; pterostigma black, 2½ mm.; 8 ante-cubital and 7 post-cubital nervules in anterior-wings. In the posterior-wings there is a small, furcate, basal, blackish-fuscous spot, not extending to the first ante-cubital, and another small spot of similar colour below it, bordering the membranule, and continued outwardly on the two cross-nervules in the second series of anal cellules (in the specimen before me the triangles have a cross-nervule in both anterior-wings, and in the left posterior; it is empty in the right posterior); membranule whitish-cinereous.

Head dingy-yellow; in the excision of the top of the front is a triangular black mark, extended, as a line, along the upper margins of the eyes (antennæ black); the head is clothed with cinereous pilosity, especially dense on the vesicle, and on the occiput, where it forms a long erect fringe: back of head yellow, margined with black, and with a dense whitish-cinereous fringe. Thorax pale olivaceous, very densely clothed with cinereous pilosity; the dorsal crest, a broad humeral band, and two lines on the sides, black or blackish, the space between the two lateral lines is yellow (in which is placed the black spiracle). Abdomen moderately depressed; pale at the base, but there is a broad black dorsal band extending from the middle of the third segment to the apex, expanded at the posterior end of each segment, and leaving an elongate lateral brownish-yellow space on each segment, from 4 to 8 (the coloration of the ventral surface is nearly similar; but the pale is more prominent and the dark more subdued): on the 10th dorsal segment there is a central straight carina, on either side of which is a faint curved carina; the outer edge of this segment slightly excised. Legs black; the anterior pair yellowish up to near the end of the femur.

Appendages black. The superior appendages (3 mm.) not quite so long as the 9th and 10th segments combined: viewed above, they are straight, convergent, and sub-cylindrical, but somewhat before the apex they dilate, and become almost two-branched, the inner branch forming a short triangular tooth, the outer being much longer, curved outwardly, and stout and obtuse at the apex, its inner edge excised: viewed from the side, these appendages are very straight, gradually thickened, with a triangular production or tooth near the middle of the lower edge; *the apical portion* in this position *may be compared in form to a dog's (or wolf's) head, with long profile and short erect ears.* Inferior appendage extending to the portion of the superior, where these latter become suddenly altered in form (yellowish internally above), rather broad, slightly curved upward, the apex broadly excised, leaving the outer angles very prominent.

[♀ unknown to me, but I believe that both sexes exist in the collection of my friend Baron De Selys-Longchamps.]

Hab.: Western North America (Washington Territory, collected by the late *H. K. Morrison*). In my collection.

In general form, dense pubescence, &c., this quite agrees with the allied species. In the form of the spot on the top of the front it approaches *cynosura*, Say, and in the shape and extent of the dark spots at the base of the posterior-wings there is resemblance to *spinigera*, Selys. The shape of the apical portion of the superior appendages, seen laterally, is such as (in the absence of figure) to have occasioned a familiar comparison, and it also suggested the specific name.

Lewisham, London: *August*, 1886.

DISCOVERY OF THE FEMALE OF *EURYBREGMA NIGROLINEATA.*

BY JOHN SCOTT.

♀. Undeveloped. Length, $1\frac{3}{4}$ line (Paris).

White, after death changing to pale yellowish, with a brown streak down each side of the centre of the pronotum, scutellum and abdomen, much broader on the latter than on either of the former; margins of the abdomen black.

Head: crown white or pale yellowish; basal foveæ deep, anterior one very minute, all three brown coloured. Face convex, brown, palest down the centre. Antennæ yellowish. Eyes dark brown. Pronotum white or pale yellowish, with a brown streak on each side of the centre, nearly in the middle of which is a small fovea. Scutellum white or pale yellowish, with a fine central keel, and a longitudinal brown streak on each side. Elytra abbreviated, transparent, reaching to a little beyond the base of the 3rd segment of the abdomen; entire marginal nerve whitish. Legs pale yellowish; apex of the third joint of tarsi and claws black. Abdomen white or pale yellowish, with a broad, longitudinal, pale brown band down each side of the centre; side-margins black, the pale intermediate space between the latter and the brown streaks with two diagonally-placed minute brown spots on each segment; viewed from behind the last segment with a black spot on each side.

Being now for a time on the Solent, and finding it impossible to get to Fawley in the New Forest, where I took the male of this fine species some years ago, as mentioned in this Magazine, vol. xii, p. 92, I lately made a few pilgrimages along the shore from where I am residing, and at last, after very hard work, had the pleasure of taking a single ♀ example not far from the mouth of the Southampton Water. Since then I have taken a male at the same place.

July 1st, 1886.

Lygæus equestris, L., at Dover.—On the afternoon of September 7th, when out for a ramble on the cliffs in company with my friend Mr. J. J. Walker, I was fortunate enough to sweep up this beautiful bug. I at first thought I had taken *Therapha hyoscyami*; Mr. Walker, who was close to me at the time and saw it in my net, thought the same, or else that it was something better. Upon returning home we compared it with the figure of *Therapha hyoscyami* in Douglas and Scott's *Hemiptera-Heteroptera*, but found it did not agree either with the figure or with the description; nor did it with that in Mr. Saunders' Synopsis. Noticing the conspicuous round white spot on the membrane, Mr. Walker suggested it might be *Lygæus*, and as I was writing to Mr. E. Saunders the next day, I mentioned the capture in my letter, with a slight description; in answer to which Mr. Saunders said "it sounded like *Lygæus*." Since then I have forwarded it to him for identification, and he has very kindly returned to me as the above species.

Lygæus equestris, L., is in the List of British *Heteroptera* in the Entomologist's Annual for 1861, p. 47, besides *L. familiaris*, Fab., and *punctum*, Fab. All three are also in the Reputed Species in Douglas and Scott's *Hemiptera*.—C. G. Hall, Dover: *September 12th*, 1886.

Habitat of Miridius quadrivirgatus, Costa.—Mr. Hall's query in Ent. Mo. Mag., vol. xxiii, p. 91, reminds me of my experience with the above insect. I have taken it frequently and not uncommonly at several places near Hastings, always by sweeping in grassy places, and never in connection with sallows of any kind. The spot in which it occurred most abundantly was a sloping field of no great extent, with a western aspect, about a mile from the sea, and overgrown with grasses and a considerable variety of other low herbage. The insect is certainly not confined to the coast line, for I have taken it as far inland as Robertsbridge, about twelve miles from the sea.—E. A. Butler, Crouch Hill, N.: *September* 8*th*, 1886.

Capture of Leptomorphus Walkeri, Curt., a rare fly.—Yesterday I had the pleasure of taking a specimen of *Leptomorphus Walkeri*, one of the rarest and prettiest of our British *Diptera.* It is admirably figured by Curtis.—C. W. Dale, Glanville's Wootton: *September* 11*th*, 1886.

Scybalicus longiusculus at Portland.—On July 2nd I had the pleasure of taking one of the above in the Isle of Portland; I also captured a couple of *Polystichus vittatus* at the Burning Cliff on May 24th. *Eupithecia irriguata* has been very scarce this season, but *E. subciliata* common.—Id.

Notes on Adimonia tanaceti, L.—This beetle is common in a little moist meadow adjoining Maltby Wood, near Louth, Lincolnshire, where its larvæ (black above and dark olive-green beneath) may be found plentifully feeding on the leaves of *Scabiosa succisa.* One one occasion I also saw them eating *Centaurea nigra.* On July 6th this year I took home some nearly full-fed larvæ; one of them which I separated from the rest pupated on July 11th, and remained in that state eleven days. The larva, when about to pupate, retired to a chink in the earth at the bottom of the vessel in which it was kept, and surrounded itself with a slight cocoon of brown silk, to which small pieces of earth were attached. The pupa is yellow, with a few short black hairs above; the antennæ and wings lie immediately behind the first and second pair of legs, and their ends overwrap the third pair of legs. Two days before the imago emerged, the head, thorax and legs of the pupa darkened into grey.—H. Wallis Kew, Louth, Lincolnshire: *September* 2*nd*, 1866.

Tenacity of life in Lucanus cervus.—A large ♂, caught on August 7th at Battersea Park was given to me, and was still living after ten minutes' exposure to the densest fumes of sulphur I could create. I never knew of an insect existing so long in such an atmosphere. Another curious fact respecting it is, that after remaining on the setting board nearly a fortnight, it almost fell to pieces on removal; this circumstance I can only attribute to some peculiar action of the sulphur fumes upon the beetle, and would recommend Entomologists to kill *L. cervus* for the future in boiling water. This insect is, I hear, common this year; I have received two from Battersea Park this month.—E. Brunetti, 129, Grosvenor Park, Camberwell, S.E.: *August* 10*th*, 1886.

Odour from Creophilus maxillosus.—On catching in the house a specimen of this beetle last June, it exuded a thick white liquid which gave out an odour exactly resembling that of bananas. I do not know if this has been noted before.—Id.

Sirex gigas ovipositing.—In the spring of this year a child denuded a branch of Deodara, of about six inches in diameter, of its bark on one side for a space of about three feet; the wood appears perfectly sound and is extremely hard. On the 30th June one of my children came to me and said, "Do come, I have got something really good on the fir tree." On proceeding to the spot I found a fine female of *Sirex gigas* sitting on the bare spot of the Deodara branch; expecting it would fly away, I put my hand out at once and took it by the wings, but found it adhered to the wood; at first I supposed the tarsi were the source of the adhesion, but I found this was not the case, but that the borer of the ovipositor was engaged in the solid wood, and I believe an egg was laid, though I fear I thoughtlessly destroyed it in probing the hole with a pin to ascertain its depth; this proved to be very slight, not more than a line. It seems extraordinary that such a solid piece of wood should be selected to receive the egg; but the vitality of the branch is doubtless somewhat diminished in consequence of its denudation, so that the observation would seem on the whole to support the views of those who doubt whether xylophagous insects ever attack perfectly healthy and vigorous wood.—D. Sharp, Southampton: *July 1st*, 1886.

Anisolabis maritima, Bonelli.—Numerous specimens of this earwig were captured by Mr. T. J. Bold in September, 1856, at South Shields, under stones on the sand (*vide* Trans. Tyneside Naturalists' Field Club, vol. iv, 1858—60, pp. 55—6). It was then supposed to have been recently imported by shipping; but no evidence of its having established itself in the country seems to have been given since. Would not some Entomologist of the district make search for this interesting species, and allow us to add it to our very meagre Orthopterous fauna?—Eland Shaw, 13, Lanhill Road, London, W.: *September*, 1886.

British Orthoptera.—If any Entomologist will give me well authenticated information of the recent occurrence in Britain of the following *Orthoptera*, I shall be greatly obliged:—*Anisolabis maritima*, Bon., *Œdipoda cœrulescens*, Linné, *Psophus stridulus*, Linné, *Decticus verrucivorus*, Linné, *Œcanthus pellucens*, Scop., *Nemobius (Acheta) sylvestris*, Fab.—Id.

Deilephila euphorbiæ reported from Bowdon.—I have had a specimen of *Deilephila euphorbiæ* brought to me, which was caught at Bowdon this season; evidently the larva had fed near where it was found, at rest on the trunk of a tree. Both wings are crippled on the right side, it is otherwise perfect and in beautiful condition.—Joseph Chappell, 29, Welbeck Street, Manchester: *September 1st*, 1886.

Habits of Phycis carbonariella (Salebria fusca).—One of the most singular preferences known among small moths is that of *Phycis carbonariella* for burnt places on heaths. A fire, lighted by accident, or for mischief, or sometimes to allow of the growth of young herbage, sweeps across a heath destroying everything (plants and insects) for hundreds of yards, and leaves a dreary waste of burnt *débris* and charred sticks, and when the next autumn arrives, *Phycis carbonariella* deserts the living heather on which it surely must have fed and resorts in numbers to this burnt ground. I have certainly seen a hundred specimens on such a piece of ground in less than an hour, when the whole number disturbed from among living heather in an afternoon would not exceed four or five, and this on occasions when they flew quite freely, towering in the wildest manner. The resemblance of the moth to the charred sticks is wonderfully close, and its sagacity in choosing such a resting place would be equally surprising if it could only be satisfied to sit still, and not hurry away at the smallest alarm.

The only satisfactory explanation appears to be that the creature has an acute sense of the fitness of things, and feeling that its black coat harmonizes but ill with anything that is living or growing, it congregates where the fire has reduced everything to the same carboniferous condition. This seems to be an unexpected application (by the moth) of the theory of natural selection, but as the *normal* condition of heaths can hardly be that of periodic burning, or can hardly have been so long enough to produce so important a modification in a moth, and as there are very few birds on these heaths, and none equal to inflicting serious damage on so active an insect, I can only suppose that a theory of individual *preference* is applicable in this case.—Chas. G. Barrett, King's Lynn, Norfolk: *September*, 1886.

Food of Acidalia luteata.—In a pretty but very swampy dingle between two of the hills of Cannock Chase I found *Acidalia luteata* quite commonly. The dingle is of considerable length, but they are crowded together at its upper end among the last few alder trees, in which they rested, and about which they flew freely in the afternoon and evening. Possibly this crowding may have been caused by the wind, which blew strongly up the dingle day after day. The place was difficult to examine from its extreme wetness, but I think that I am safe in asserting that no maple whatever grew in the vicinity, and that alder must without doubt have been the food plant of the larvæ. Mr. Hill tells me that the moth is common in similar situations in Derbyshire, and Mrs. Fraser found it some years ago under the same conditions in one of the valleys in the Highlands of Perthshire. This habit of this very pretty species is probably well known in the north, but I do not remember to have seen it recorded. In the south and east its food plant is certainly the maple (*Acer campestre*).—Id.

Probable food of Gelechia longicornis.—I saw this pretty insect alive for the first time in the beginning of June on Cannock Chase; it was then just beginning to emerge, and was to be found almost exclusively among *Empetrum nigrum*, from the tufts of which plant I secured many perfect and lovely specimens. Later in the month it was to be found occasionally in various parts of the heath where apparently there was no *Empetrum*, but these specimens were usually more or less worn, while, during the whole month, the tufts of that plant would furnish fresh and perfect specimens, many of them females. My stay in the district was too short to allow of any search for the larva, but I have little doubt that it will be found to feed on the *Empetrum*.

The beauty of the moth when alive is very striking, especially in the red and ashy-white varieties, and there is something extremely curious in their resemblance in form, attitude, and general appearance to the pretty *Pempeliæ* (*subornatella*, *dilutella*, and *porphyrella*), species which cannot be expected to occur in the same district or at the same season, and to which this species is not in the smallest degree allied.—Id.

Singular habit of Hepialus hectus.—I have again noticed the very distinct and even powerful perfume of pine-apple given off by the male *Hepialus hectus*, and now think that it is connected with rather abnormal sexual habits in this species.

One evening in June they commenced flying very early (about half-past eight o'clock) in broad daylight, and on capturing some males which were quite freshly out I noticed the perfume very distinctly. Presently, while watching two males oscillating in their peculiar manner in a little space enclosed by two or three bracken fronds, I saw a female flying along, when she entered the space, she *flew against* one of the males, buzzed about a little, and then settled on one of the bracken fronds, where she hung with quivering wings. Instantly the male began to search for her, not apparently assisted at all by vision, but buzzing blindly up and down and around the spot until he came in contact with her quivering wings.

This proceeding was so surprising that I watched further, and presently another female went through a similar performance, and then a third, the males in each case being within a very small space, regularly oscillating until discovered and interrupted. Yet the males were not plentiful at all, and bracken was of course very abundant, and the female coming from a distance, had apparently no reason for flying into the little space occupied by the males, unless, as seemed evident, drawn into that direction by the scent. I certainly did not see any female fly *past* one of these oscillating specimens.

A somewhat similar habit has been recorded in the case of *Hepialus humuli*, where also the female flew actually *against* the oscillating male; and I feel no doubt that this curious reversal of the usual order of things takes place in each species in which the males, instead of flying in search of their partners, oscillate over a limited space.—Id.

Leucania vitellina, &c., at Finchley.—I have occasionally collected in my garden here during the past summer. By netting I captured three *A. ophiogramma*, and at sugar, amongst numerous species, several *T. subtusa*. About a fortnight ago I was so fortunate as to secure at sugar a fine ♂ *L. vitellina*, and since have taken two *X. gilvago*. The occurrence of *L. vitellina* so far inland surprised me, as, so far as I remember, it has hitherto in this country been observed only on the coast.—W. T. Sturt, Cyprus Road, Finchley: *September*, 1886.

Cidaria reticulata in North Wales.—While staying in North Wales last week

I gathered a quantity of *Impatiens noli-me-tangere*, and upon opening the bag yesterday I found a full-fed larva of this rare species; also a couple of *Plusia* larvæ (small), which I think must be *P. bractea*. I shall no doubt find more larvæ when I carefully search the plant.—E. G. Meek, 56, Brompton Road, London, S.W.: *September 3rd*, 1886.

Occurrence in West Sussex of Cosmopteryx Schmidiella, Frey, a species new to Britain.—So far as I know, none of the beautiful moths of the genus *Cosmopteryx* have as yet been recorded from Mr. H. C. Watson's vice-county of West Sussex, although the food-plants of all the known British species occur therein abundantly. It is with the greater pleasure, therefore, that I am able to announce the finding of *C. Schmidiella* in the larval state in some numbers last week a few miles from Worthing. The insect seems to frequent plants of *Vicia sepium* growing in low damp hedgerows. When the larvæ are scarce they feed chiefly in the lower leaves of the plant; when they are numerous they attack also the upper ones. It appears that even when the insect occurs somewhat freely, it is very local in its distribution, and that one may search a quantity of the vetch before meeting with any success.

A full life-history of the species has been published by Mr. Stainton (Nat. Hist. Tin., xii, 30), and he has also kindly told me that there is no doubt as to the identity of my larvæ.—W. H. B. Fletcher, Fairlawn, Worthing: *Sept. 15th*, 1886.

On the specific distinctness of Tephrosia crepuscularia, W. V., and biundularia, Esp.—With every respect for the great discrimination and good judgment of Mr. Barrett, I must demur to the conclusions at which he arrives respecting these two insects. He appears to me to rely too much on the difficulty of naming an extreme form of either species, and to take too little notice of the marked *natural* differences between them. To put the case briefly, *crepuscularia* emerges in March or April, *biundularia* in May or June. They are very similar in colour and markings, but *crepuscularia* is browner than its near relative, and can be distinguished by that character, which is tolerably constant. The offspring of both insects in favourable seasons or localities feed up and emerge the same year, or part of the brood does. This second brood, in both species, presents the same characteristics as the first, slightly modified only as is usual in second appearances. Both vary more or less in intensity of colour, pale *crepuscularia* approaching normal *biundularia*, dark *biundularia* approaching normal *crepuscularia*. Extreme forms of both occur that may be said to overlap the other, rendering the identification of a single abnormal specimen rather difficult. But selected specimens, or the series found in the best cabinets are no true basis for argument, and conclusions founded on such an illustration are likely to be erroneous. To arrive at a correct conclusion, series should be examined *as they occur in nature;* those occurring at one time and place being put together and compared with others taken at another time or place, or both. Mr. Barrett lays stress on the fact that he could not name some specimens sent him by Professor Zeller, but these specimens were selected as a puzzle, and it is clear from the quotation given that Zeller himself could separate the two forms, though he did not believe them distinct. Had he sent a fair series as they were taken, including these puzzling specimens among their congeners, I am tolerably certain Mr. Barrett would have had no difficulty in the matter.

Can any one name with certainty an odd specimen of *A. psi* and *tridens*, of *C. alsines* or *blanda*, without comparison of others? Yet with a fair series to examine and compare, there is no great difficulty with either. No one supposes that because of the difficulty of naming an isolated example of one of these insects that the species are identical, though they may occur at the same time and place. How much less reason then for fusing *crepuscularia* and *biundularia*, when they actually occur at different periods of the year, and are known not to be two broods of the same insect. The difficulty with the larvæ is not greater than obtains with some of the *Zygænæ*, and the perfect insects of these are so puzzling that probably no two Lepidopterists agree precisely as to the number of species they recognise. Here (county Durham), which I suppose Mr. Barrett would call a northern locality, we get *biundularia* in May and June. They are always of the normal form, typical *biundularia*. I have more than once reared it from the egg, and never got any departure from the type. Yet this is a district where dark varieties of many species occur not uncommonly. Mr. Barrett concludes that it is "unreasonable to attempt to keep up the purely artificial distinction between these two forms." To me it seems much more unreasonable to attempt to ignore the truly natural distinction between them, merely because in odd specimens we are unable to find an artificial—perhaps I had better say superficial—distinction.—John E. Robson, Hartlepool: *September 8th*, 1886.

Description of the larva of Pterophorus tetradactylus.—Early in the season of last year, Mr. Eustace R. Bankes, of Corfe Castle, found a larva on wild thyme, from which he bred a specimen of *Pterophorus tetradactylus*; so, knowing my want of the species, he this year very kindly made a special search for it, the result being, that on May 20th, I had the pleasure of receiving three specimens from him, together with several healthy growing plants of the thyme on which to feed them.

Length, when full grown, about half an inch, and of ordinary *Pterophorus* shape, *i. e.*, plump, stoutest in the middle, attenuated at the extremities, rounded above, flatter beneath; head small and glossy, considerably narrower than the second segment; a tuft of short hairs springs from each tubercle. Ground-colour bright pea-green, when younger (*i. e.*, previous to the last moult) having a yellowish tinge; head yellowish-green, the mandibles and a spot on each side of them brown; the broad dorsal stripe is of a considerably darker shade of green than the ground-colour, and is powdered on each side with greyish-white; sub-dorsal stripes of the same dark green colour, but not so conspicuous; spiracular stripes rather broad, yellowish-grey; segmental divisions and hairs white. When younger the segmental divisions are yellowish-grey, and the hairs grey. Ventral surface, legs and prolegs uniformly of the bright pea-green of the dorsal area.

I bred no imagos, as the larvæ came to grief during my absence in London; but in this case it did not much matter, for Mr. Bankes having fortunately reared the imago from a similar larva the previous year, had thus made sure of the species. Apart from that they were too large for *P. parvidactylus*, the other thyme feeding species, which, moreover, Mr. Bankes believes does not occur in the district.—Geo. T. Porritt, Huddersfield: *September 3rd*, 1886.

Obituary.

Maurice Girard.—According to "Le Naturaliste," this well-known French Entomologist died suddenly, very recently, at Lion-sur-Mer (whither he had gone to spend the vacation), aged 64. He held an official position on the Commission for public instruction in Natural History. In 1867 he was President of the French Entomological Society. France has produced many entomologists who have done more and much better original work than did Girard, but she has lost in him a most industrious writer on all subjects connected with applied entomology, and a careful compiler of entomological educational works. In 1876 he presented to the French Academy an important Memoir on the Diseases of the Vine in Charente, in which the *Phylloxera* is treated upon in a considerably exhaustive manner. He was a frequent communicator of notes at the meetings of the French Entomological and other kindred Societies. A very useful little manual from his pen, intituled, "Les Métamorphoses des Insectes," passed through numerous editions. Another similar work by him treats on "Les Abeilles." His "Histoire Naturelle : Zoologie" is an educational manual somewhat on the plan of Milne-Edwards' "Cours Elémentaire," but more extended. But what is probably his principal work is the "Traité élémentaire d'Entomologie," of which three thick volumes have appeared ; a laborious and careful compilation brought down to date, and embodying an enormous mass of information, with numerous plates, which are, for the most part, adapted from Guérin's "Iconographie." In manner Girard was courteous and affable ; always seeking information, he was always ready to impart it.

Baron Edgar von Harold.—Recent German publications record the death, on the 1st of August, of this eminent Coleopterist, the fellow worker of Dr. Gemminger in the compilation of the well-known Munich Catalogue of *Coleoptera*, entitled "Catalogus Coleopterorum hucusque descriptorum synonymicus et systematicus." Von Harold was an officer of the Royal Guard of Bavaria, and saw active service in the war of 1866 ; a severe wound in the engagement at Kissingen during that campaign appears, however, to have closed his military career. We gather from certain allusions in his earlier articles on his special group, the *Copridæ*, that he commenced the study of the *Aphodiinæ* long before 1857, in which year he began gathering the material for the great Catalogue. His first essay, published in the "Berliner entomologische Zeitschrift," 1859, indeed, gave evidence of considerable previous study, and showed that the entomological ranks had been recruited by a writer of great acumen and power of original observation. To this paper, entitled, "Contributions to the knowledge of Coprophagous Lamellicorns," others of similar vigorous analytical style on the same subject appeared in rapid succession until about four years ago, when, to the regret of his numerous admirers and correspondents in Europe and America, his activity suddenly ceased.

The first volume of the Munich Catalogue was published in 1868 ; the 12th and last in 1876. In 1867 he started a serial work of his own, specially devoted to *Coleoptera*, under the title of "Coleopterologische Hefte ;" in this appeared many of the important monographs of genera of *Copridæ*, and elucidations of questions relating to classification and nomenclature, for which he will long be gratefully remembered by students of this large and difficult group of *Coleoptera*. The "Hefte" continued to appear at irregular intervals until 1879, when the 16th and last was published. In 1879 he undertook also the Editorship of the "Mittheilungen des münchener entomologischen Verein," and contributed many valuable papers to its pages; the 5th and last annual volume of this serial appeared in 1881. Numerous monographic and faunistic papers from his active pen were published during the years 1860 to 1881 in other scientific periodicals, chiefly the Annals of the French Entomological Society, and the "Stettiner entomologische Zeitung." Some time previous to the cessation of his active career as an Entomologist he accepted a post at the Berlin Museum, under the late Dr. Peters; he published but little during this period.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY, *August* 19*th*, 1886: The Vice-President in the Chair.

Dr. H. C. Lang, F.L.S., and Mr. J. M. Adye were elected Members.

Mr. Sheldon exhibited bred series of *Conchylis dilucidana*, St., *Grapholitha geminana*, St., *Ephippiphora cirsiana*, Zell., *E. fœnella*, L., and some interesting forms of *Xanthosetia zœgana*, L., from Hackney Marshes. Mr. Wellman, *Acidalia emarginata*, L., bred from ova. Mr. J. J. Weir, xanthic varieties of *Erebia Epiphron*, Knoch., *Epinephele Janira*, L., *Satyrus Semele*, L., *Cœnonympha Pamphilus*, L., a very pale *Polyommatus Phlœas*, L., and a light specimen of *Eubolia bipunctaria*, Schiff. Mr. J. A. Cooper, a long series of *Argyrolepia badiana*, Hb., and he stated that both Mr. Stainton and Mr. Merrin gave the food plant as the roots and stems of burdock (*Arctium lappa*), but he had searched carefully, and had been unable to find any larvæ in the roots and stems, although they were plentiful in the seed-heads of the plant, from which those now exhibited were bred; he also exhibited varieties of *Spilosoma menthastri*, Esp., and *Phorodesma smaragdaria*, Fb., from larvæ found in the Essex Salt Marshes. Mr. Jobson also exhibited *P. smaragdaria* and *Erastria venustula*, Hb., the latter bred from ova. Mr. J. T. Williams, an almost albino variety of *Acidalia bisetata*, Hufn., and a variety of *Larentia olivata*, Borh., having the whole of the base of the wings suffused as far as the band. Mr. C. Oldham, varieties of *Calymnia trapezina*, L. Mr. Mera, pale and dark varieties of *Abraxas grossulariata*, L. Mr. Frohawk, *Timandra amataria*, L., bred from ova laid on July 7th last, and coloured drawings of the larva and pupa. Mr. Goldthwaite, black forms of *Eupithecia rectangulata*, L.

September 2*nd*, 1886: The President in the Chair.

Mr. J. H. Carpenter exhibited dark forms of *Smerinthus populi*, L. Mr. Wellman, a box of Exotic *Lepidoptera*, all taken at sea, and one, a species of *Sphinx*, having been captured one thousand miles from land; also a large number of varieties of *Bryophila perla*, Fb., and living larvæ of *Cidaria picata*, Hb., and *Acidalia rusticata*, Fb. Mr. Sheldon, grey and red forms of *Noctua castanea*, Esp., bred from larvæ taken on Shirley Heath, Surrey. Mr. South, nine varieties of *Lycæna Corydon*, Fb., from Eastbourne, and he said that he had also taken a number of specimens which formed the connecting links between those now exhibited; one group had but few spots on the under-side, in another the spots were absent, and in the remaining group the spots were confluent: he also exhibited varieties of

Abraxas grossulariata, L., and specimens of *Dicrorampha consortana*, S., *var. distinctana*, Hein. With reference to this last mentioned insect, Mr. South said that he first took a couple of specimens in 1881 in North Devon, one of which was sent to Mr. C. G. Barrett, who identified it as *Dicrorampha distinctana* of Heinemann. This year he has bred 14 specimens from a batch of *Chrysanthemum* received from North Devon, and the larva was identical with the description of a larva of *consortana* taken by him at Shanklin, Isle of Wight. Mr. J. J. Weir, exhibited seven specimens of *Argynnis Paphia*, L., and one of *Argynnis Euphrosyne*, L., and drew attention to a number of white spots on the wings, which he stated were not suffused spots as in *Janira*, but were always well defined, and in nearly all cases symmetrical. A discussion then took plate as to the origin of these spots, in which Messrs. South, Carrington, Adkin, Sheldon, and others took part. Mr. Adkin, exhibited light and dark forms of *Cleoceris viminalis*, Fb. Mr. Cooper, *Zonosoma orbicularia*, Hb., *Eupithecia subfulvata*, Haw., and *Tephrosia biundularia*, Bork., bred from a female captured last June, the larva having fed up on knotgrass. Mr. T. R. Billups, a rare species of *Hymenoptera—Tachytes unicolor*, Panz., taken at Hayling Island June 7th; the following species of *Coleoptera*; the very scarce *Choragus Sheppardi*, Kirb., from Broadstairs; *Molorchus minimus*, Scop., and *Mycetoporus longulus*, Mann., from Bookham; and the scarce *Panagæus quadripustulatus*, Sturm.; also two local species of *Hemiptera*, *Phylus coryli*, Linn., and *P. avellanæ* from Westerham, and *Ledra aurita*, Linn., from Broadstairs.—H. W. BARKER and W. A. PEARCE, *Hon. Secs.*

ENTOMOLOGICAL SOCIETY OF LONDON: *September 1st*, 1886. — ROBERT MCLACHLAN, Esq., F.R.S., President, in the Chair.

The following were elected Fellows:—The Rev. Professor Dickson, D.D., of Glasgow University; Mr. P. Cowell, of Liverpool (formerly subscribers); Mr. A. O. Walker, of Colwyn Bay, North Wales; and Mr. Lyddon Surrage, of Hertford College, Oxford.

The President remarked with regard to the gnats from the Kent Waterworks, exhibited at the last meeting, that Professor Westwood had since informed Mr. Douglas that they were only the ordinary *Culex pipiens*.

Mr. Slater exhibited certain parasites found on a larva of *Smerinthus tiliæ*, which Mr. Waterhouse believed to be *Uropoda vegetans*, a species of *Acari*.

Mr. W. Warren exhibited the following *Lepidoptera*, viz.: — *Eupithecia fraxinata*, caught in Regent's Park; *E. innotata* (Hüb.), bred from *Artemisia maritima;* a variety of *Eupithecia satyrata;* a *Gelechia*, caught in Wicken Fen twenty years ago by Mr. Bond, and believed to be a new species; *G. fumatella* (Dgl.) or *celerella* (Stn.) from Hayling Island; *G. vilella* (Zell.), bred from larvæ collected on the Essex coast on mallow; *Lithocolletis scabiosella* (Dgl.), bred from larvæ found near Croydon; and *Catoptria parvulana* (Wlk.), bred by Mr. Vine, of Brighton, from *Serratula tinctoria*. He also exhibited larvæ of *Gelechia vilella*.

Mr. South exhibited specimens of *Dichrorampha distinctana* (Hein.), and stated that he considered it to be merely a variety or local form of *D. consortana*, from which, in the larval stage, it could not be separated.

Mr. Stevens exhibited a living specimen of *Clerus formicarius*, found under the bark of an ash tree in Arundel Park, Sussex.

Mr. Billups exhibited *Chrysis succincta* (Linn.), taken by sweeping at Chobham on the 28th July last. He stated that this very rare species was recorded by Shuckard as having been taken in a sandy lane near Brockenhurst, in the New Forest, and at Blackwater, on the borders of Berks and Hants; and he further stated that the late Mr. Frederick Smith had taken specimens in Hampshire. He also exhibited *Microphysa elegantula* (Bär.), taken at Broadstairs, Kent, on the 23rd August last.

The Rev. W. W. Fowler exhibited, on behalf of Mr. Theodore Wood, a larva of *Langelandia anophthalma* (Aubé), a species new to Britain.

Mr. H. Goss exhibited specimens of *Oxygastra Curtisi* (Dale), recently taken near Christchurch, Hants. He stated that he had met with the species in the same locality in 1878, but had never seen it anywhere else in the United Kingdom, nor was he aware of any recent record of its capture. Mr. McLachlan observed that the species was taken many years ago in Dorsetshire by the late Mr. Dale and others, but that he knew of no recent captures except those recorded by Mr. Goss. He made some remarks as to the distribution of the species on the continent of Europe.

Mr. McLachlan exhibited a specimen of *Dilar meridionalis* (Hagen), taken by him in July last in the Pyrénées Orientales; also about 150 examples of the genus *Chrysopa* from the same district, where these insects abounded. Amongst them were *C. vulgaris* (Schneider), *perla* (L.), *Walkeri* (Brauer), *viridana* (Schneider), *tenella* (Schneider), *prasina* (Burm.) and varieties, *flava* (Scop.), *septempunctata*, (Wesm.), *flavifrons* (Brauer), and others not yet fully identified. He obtained about 1500 specimens of *Neuroptera* in all families during his recent visit to the Pyrenees, which were being prepared for study. He also exhibited a few *Coleoptera* from the same district, and remarked on the extraordinary abundance of the pretty Lamellicorn, *Hoplia cærulea*, which was so common as to give the meadows the appearance of being studded with multitudes of brilliant blue flowers.

Mr. C. O. Waterhouse called attention to the numerous reports, which had lately appeared in the newspapers, of the supposed occurrence of the Hessian Fly (*Cecidomyia destructor*) in Britain, and inquired whether any communication on the subject had reached the Society. The Rev. W. W. Fowler stated, in reply, that he had been in communication with Miss Ormerod on the subject, and that she had informed him that neither the imago nor larva of the species had been seen, and that the identity of the species rested on the supposed discovery of the pupa.

Mr. A. H. Swinton communicated a paper, entitled "The dances of the Golden Swift."—H. Goss, *Secretary*.

LIST OF BRITISH *TIPULIDÆ*, &c. ("DADDY-LONGLEGS"), WITH NOTES.

BY G. H. VERRALL, F.E.S.

The old family *Tipulidæ* is now commonly divided into four, as in the list below. We have had no list of the British species since Osten-Sacken's systematic arrangement of the genera in his admirable Monograph of the North American forms. I believe I have more or less satisfactorily disposed of all Walker's doubtful species, which will be of very great use to future workers in this group; but they require still closer study. The number of species new to Britain is surprising, for, in addition to twenty-eight which I introduced last January, I now bring forward about fifteen more, and have still nearly twenty-five others, which I have either failed to recognise, or of which I possess insufficient materials for identification.

I do not profess to have given a complete list of the reputed British species.

I intend following up the list with tables and notes.

DIXIDÆ.

Dixa, Mg.

aprilina, Mg.
cincta, Curt.
fuliginosa, Curt.
æstivalis, Mg.
maculata, Mg.
mœsta, Curt.
puberula, Lw.
nebulosa, Mg.
nubilipennis, Curt.

PTYCHOPTERIDÆ.

Ptychoptera, Mg.

contaminata, L.
lacustris, Mg.
paludosa, Mg.
fasciata, Wlk.
scutellaris, Mg.
albimana, F.

LIMNOBIADÆ.

LIMNOBIINÆ.

Limnobia, Mg.

bifasciata, Schrk.
xanthoptera, Mg.
annulus, Mg.
quadrinotata, Mg.
maculata, Wlk.
nubeculosa, Mg.
flavipes, F.
nebulosa, Ztt.
analis, Mg.
nitida, *n. sp.*
analis, Wlk. (*nec* Mg.).
nigropunctata, Schum.
tripunctata, F.
trivittata, Schum.
? *punctigera*, Wlk.
macrostigma, Schum.
? *inusta*, Mg.

Dicranomyia, Steph., O.-S.

aquosa, *n. sp.*
pilipennis, Egger.
turpis, Wlk.
? *pubipennis*, O.-S.
modesta, Mg.
autumnalis, Stæg.
? *albifrons*, Wlk.
mitis, Mg. ?
? *inusta*, Wlk.
disjuncta, Wlk.
stigma, Wlk.
sera, Wlk.
globata, Wlk.
lutea, Mg.
chorea, Mg.
sericata, Mg.
grisea, Mcq. ?
glabrata, Wlk. (*nec* Mg.).
stigmatica, Mg.
affinis, Schum.
morio, F.
leucocephala, Schum.
angustipennis, Ztt.
dumetorum, Mg.
transversalis, Wlk.
didyma, Mg.
oscillans, Hal.
ornata, Mg.

Rhipidia, Mg.

maculata, Mg.
ctenophora, Lw.

Geranomyia, Hal.

unicolor, Hal.
maculipennis, Curt.

RHAMPHIDIINÆ.

Rhamphidia, Mg.

longirostris, Mg.
var. ? *flava*, Wlk.

Orimarga, O.-S.

virgo, Ztt.

Antocha, O.-S.

opalizans, O.-S.
saxicola, O.-S.

THAUMASTOPTERA, Mik.
calceata, Mik.

ERIOPTERINÆ.

EMPEDA, O.-S.
flava, Schum.
imbuta, Wlk.
nubila, Schum.
tenella, Wlk.

GONIOMYIA, Steph., O.-S.
tenella, Mg.
lateralis, Mcq.
manifesta, Wlk.
flavolimbata, Hal.
sexguttata, Dale.
sexmaculata, Hal.
pulchripennis, Lw.

ACYPHONA, O.-S.
imbuta, Mg.
maculata, Mg.

MOLOPHILUS, Curt., O.-S.
ochraceus, Mg.
crassipes, Curt.
appendiculatus, Stæg.
propinquus, Egg.
bifilatus, Ver.
obscurus, Mg.
murinus, Mg.
pygmæus, Mcq.
ater, Mg.
brevipennis, Curt.

RHYPHOLOPHUS, Kolen., O.-S.
lineatus, Mg.
apparens, Wlk.
nodulosus, Mcq.
hederæ, Curt.
diuturnus, Wlk. (pt.).
similis, Stæg.
varius, Mg.
hæmorrhoidalis, Ztt.

ERIOPTERA, Mg.
macrophthalma, Lw.
flavescens, L. (et Auct.).
lutea, Ztt. (ol.).
divisa, Wlk.
lutea, Mg.
tænionota, Mg.
analis, Ztt.
fuscipennis, Mg.
trivialis, Mg.
cinerascens, Mg.
ciliaris, Schum.
sericea, Mcq.
diuturna, Wlk. (pt.).
grisea, Wlk.

SYMPLECTA, Mg.
punctipennis, Mg.
cana, Wlk.
stictica, Mg.

TRIMICRA, O.-S.
pilipes, F.

LIPSOTHRIX, Lw.
errans, Wlk.
remota, Wlk.
ignota, Wlk.
icterica, Egg.

LIMNOPHILINÆ.

IDIOPTERA, Mcq.
fasciata, L.
pulchella, Mg.
maculata, Mcq.
fasciata, Schum.
trimaculata, Ztt.

EPHELIA, Schin.
miliaria, Egg.
? *mundata*, Lw.
apicata, Lw.
submarmorata, *n. sp.*
marmorata, Mg.
decora, Hal.

DACTYLOLABIS, O.-S.
Frauenfeldi, Egg.

PŒCILOSTOLA, Schin.
punctata, Schrk.
ocellaris, Mg.
pictipennis, Mg.

EPIPHRAGMA, O.-S.
picta, F.
ocellaris, Curt.

LIMNOPHILA, Mcq.
Meigenii, Ver.
nigrina, Mg. (*nec* W.).
dispar, Mg.
punctum, Wlk.
lineola, Mg.
ferruginea, Wlk.
lineolella, *n. sp.*
lineola, Wlk.
? *fulvonervosa*, Schum.
aperta, *n. sp.*
ferruginea, Mg.
præusta, Schum.
flavescens, Mg.
unicolor, Wlk. (desc. *nec* F
ochracea, Mg.
lucorum, Wlk.
tempestiva, Wlk.
aberrans, Wlk.
bicolor, Mg.
tarda, Wlk.
punctum, Mg.
glabricula, Mg.
longicornis, Schum.
binotata, Ztt.
fuscipennis, Mg. (*nec* Schin
discicollis, Mg.
lucorum, Mg.
sepium, Ver.
lucorum, *var. β*, Zett.
nemoralis, Mg.
obsoleta, Wlk.
adjuncta, Wlk.
inclusa, Wlk.
leucophæa, Ztt., Wlk. ?
filata, Wlk.
senilis, Hal.

TRICHOCERA, Mg.
annulata, Mg.
fuscata, Wlk.
hiemalis, Dg.
saltator, Harr.
fuscata, Mg.
regelationis, L.

ANISOMERINÆ.

ANISOMERA, Mg.
æqualis, Lw.
nigra, Wlk.
Burmeisteri, Lw.
nigra, Burm.
vittata, Wlk.

PERONECERA, Curt.
fuscipennis, Curt.
lucidipennis, Curt.

AMALOPINÆ.

Ula, Hal.

ilosa, Schum.
mollissima, Hal.
vagans, Wlk.
inconclusa, Wlk.
macroptera, Mcq.

Dicranota, Ztt.

avida, Hal.
imaculata, Schum.
demissa, Hal.
finitima, Wlk.
secreta, Wlk.

Amalopis, Hal.

nicolor, Schum. (? Wlk., Fig., *nec* desc.)
mmaculata, Mg.
cculta, Mg.
traminea, Mg.
ittoralis, Mg.
tipulina, Egg.

Pedicia, Ltr.

ivosa, L.
venosa, Wlk.

CYLINDROTOMINÆ.

Cylindrotoma, Mcq.

listinctissima, Mg.
liversa, Wlk.

Liogma, O.-S.

labrata, Mg.

TIPULIDÆ.

Dolichopeza, Curt.

ylvicola, Curt.
chirothecata, Wlk.
opaca, Mik.

Nephrotoma, Mg.

lorsalis, F.

Pachyrrhina, Mcq.

rocata, L.
perpulcher, Harr.
flavofasciata, Dg.
mperialis, Mg.
scalaris, Mg.
scurra, Mg.
histrio, F.
flavescens, L. ?
lineata, Scop.
flavomaculata, Dg.
cornicina, Mg. (ol.).
maculosa, Ztt. (ol.).
maculosa, Mg.
flavescens, Wlk. (pt.).
maculata, Mg. (ol.).
cornicina, L.
sannio, Mg.
iridicolor, Schum.
guestfalica, Westh.
analis, Schum.
quadrifaria, Mg.
fascipennis, Ztt.
var. dentata, Ztt.
annulicornis, Mg.
variicornis, Schum.

Tipula, L.

nigra, L.
pagana, Mg.
dispar, Hal.
luridiventris, Ztt.
obsoleta, Mg.
marmorata, Stæg.
confusa, V. d. Wulp.
marmorata, V. d. Wulp. (ol.)
marmorata, Mg.
obsoleta, Ztt.
rufina, Mg.
longicornis, Schum.
truncorum, Mg.
hortensis, Mg.
hortorum, Mg. (ol.).
pabulina, Mg.
rufipennis, Mg.
stigmosa, Mcq.
hortulana, Mg.
submarmorata, Schum.
luridirostris, Schum.
varipennis, Mg.
simplicicornis, Ztt.
nigricornis, Mcq.
nubeculosa, Mg.
hortorum, F., L. ?
guttulifera, Ztt.
montana, Curt.
scripta, Mg.
excisa, Wlk.
melanoceras, Schum.
lineata, Stæg.
plumbea, F.
pruinosa, W.
luteipennis, Mg.
flavolineata, Mg.
antennata, Schum.
latevittata, Schum.
longicornis, Curt.
lunata, L. (et Auct.).
luna, Westh.
marginata, Mg.
lateralis, Mg.
vernalis, Mg.
? pendens, Harr.
vittata, Mg.
gigantea, Schrk.
maxima, Poda.
sinuata, F.
nubilosa, Harr.
lutescens, F.
fulvipennis, Dg.
oleracea, L.
terrestris, Harr.
paludosa, Mg.
selene, Mg.
fascipennis, Mg.
peliostigma, Schum.
selenitica, Wlk.
ochracea, Mg.
lunata, F., L. ?
vaga, Wlk.

Dictenidia, Brul.

bimaculata, L.

Xiphura, Brul.

atrata, L.
ruficornis, Stæg.
nigricornis, Mg.

Ctenophora, Mg.

ornata, Mg.
flaveolata, F.
pectinicornis, L.
splendor, Harr.
nigrocrocea, Dg.
variegata, F.

REPUTED BRITISH SPECIES OF *TIPULIDÆ*, &c.

Dixa serotina, Mg., Sys. Bes., I, 217 ; Curt., B. E., 409 : reputed on the authority of Haliday, as occurring in Ireland on the verge of the sea. I believe Meigen's species remains unrecognised.

Limnobia fusca, Mg., Sys. Bes., I, 133 ; Steph., Sys. Cat., II, 244 : this species also has, I believe, remained unrecognised since Meigen described it. Can it be *Dicranomyia turpis*, Wlk.? if so, Meigen has wrongly figured the position of the large cross vein.

L. pabulina, Mg., Sys. Bes., I, 140 ; Steph., Sys. Cat., II, 245 : this must be very near *L. sylvicola*, Schum. ; British Museum specimens are a *Dicranomyia*, like a dark *D. chorea*.

L. sexpunctata, F., Sp. Ins., II, 405 ; Steph., Sys. Cat., II, 244 : probably only *L. tripunctata*, F.

L. maculipennis, Mg., Sys. Bes., I, 136 ; Wlk., B. M. Cat., 44 : may be *D. ornata*, Mg.

L. inusta, Mg., Sys. Bes., I, 135, = *macrostigma*, Schum. ? ; Wlk., I. B. D., III, 298, = *D. mitss*, ? Mg.

L. stigma, Mg., Sys. Bes., I, 138 ; Wlk., I. B. D., III, 298, = *D. mitis*, Mg. ?

L. sexmaculata, Mcq., D., N. F. Tip., 91 ; Wlk., I. B. D., III, 303, = *Goniomyia sexguttata*, Dale.

L. plebeia, Mg., Sys. Bes., I, 127 ; Steph., Sys. Cat., II, 244, = *Limnophila filata*, Wlk. ?

L. leucophæa, Mg., Sys. Bes., I, 127 ; Wlk., I. B. D., III, 290, = *L. nemoralis*, Mg.

L. albifrons, Mg., Sys. Bes., I, 137 ; Wlk., I. B. D., III, 295, = *D. modesta*, Mg. ?

Tipula ocellaris, L., F. S., 1751 ; Curt., B. E., 50, = *Epiphragma picta*, F.

Erioptera montana, Mg., Sys. Bes., I, 110 ; Steph., Sys. Cat., II, 242.

E. grisea, Mg., Sys. Bes., I, 112 ; Curt., B. E., 557, = *Molophilus* ; Wlk., I. B. D., III, 276, = *Erioptera ! trivialis ?*

Limnobia transversa, Mg., Sys. Bes., I, 123, perhaps a *Dactylolabis* ; Steph., Sys. Cat., II, 245 : the specimen in the British Museum is a large *Amalopis*.

Trichocera maculipennis, Mg., Sys. Bes., I, 214 ; Steph. Sys. Cat., II, 250.

T. parva, Mg., Sys. Bes., I, 213 ; Wlk., B. M. Cat., 82 : the European species of *Trichocera* are too insufficiently distinguished to allow sinking this as a *var.* of *hiemalis* without closer examination.

Anisomera obscura, Mg., Sys. Bes., I, 210 ; Steph., Sys. Cat., II, 250.

A. nigra, Ltr., Gen. Cr., IV, 260 ; Wlk., B. M. Cat., 82, = *A. æqualis*, Lw. ?

A. bicolor, Mg., Sys. Bes., I, 209 ; Wlk., B. M. Cat., 82.

A. vittata, Mg., Sys. Bes., VI, 292 ; Wlk., B. M. Cat., 82, = *A. Burmeisteri*, Lw. ?, or *Peronecera fuscipennis*, Curt. (t. Schin.).

Amalopis geniculata, Mg., Sys. Bes., I, 124 ; Steph., Sys. Cat., II, 245 : the specimen in the British Museum is a small true *Amalopis*.

Phalacrocera replicata, L., F. S., 1755 ; Steph., Sys. Cat., II, 245 : the only specimens I have seen were *Limnobia quadrinotata*, Mg.

Pachyrrhina pratensis, L., F. S., 1745 ; Wlk., B. M. Cat., 64 : surely must be British, but I cannot find it.

Tipula hortorum, L., F. S., 1741; Steph., Sys. Cat., II, 248.

T. excisa, Schum., Bes. Schles. Tip., 42; Wlk., I. B. D., III, 323: undoubtedly *T. scripta*, Mg.

T. arctica, Curt., Ross. Exp., 77, T. A., 15; Dale, Ent. Mo. Mag., XX, 214, = *nodulicornis*, Ztt.?

T. irrorata, Mcq., Sui. à Buff., I, 84; Curt., B. E., 493.

T. Diana, Mg., Sys. Bes., I, 189; Wlk., B. M. Cat., 62.

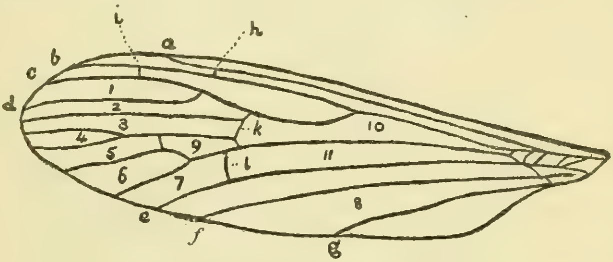
T. fenestrata, Schum., Bes. Schles. Tip., 59; Wlk., B. M. Cat., 60.

T. cæsia, Schum., Bes. Schles. Tip., 65; Wlk., B. M. Cat., 61.

T. fimbriata, Mg., Sys. Bes., I, 190; Wlk., I. B. D., III, 327: under this name I have only seen *T. paludosa*, Mg.

T. lineola, Mg., Sys. Bes., I, 181; Wlk., I. B. D., III, 323.

T. selenitica, Mg., Sys. Bes., I, 187; Wlk., I. B. D., III, 329, = *T. peliostigma*, Schum.



Neuration of *Cladura*, adapted after Osten-Sacken.

Costal vein = upper edge.
Mediastinal vein ends at ...... *a*
Subcostal ,, ,, ... *b*
Radial ,, ,, ... *c*, *d*
Postical ,, ,, ... *e*
Anal ,, ,, ... *f*
Axillary ,, ,, ... *g*

Præfurca = part of radial vein from its origin until its forks.
Subcostal cross vein .... *h*
Marginal ,, ... *i*
Small ,, ... *k*
Great ,, ... *l*

Submarginal cells...... 1 & 2
Posterior cells............ 3 to 7
Anal cell 8
Discal cell 9
Basal cells 10, 11

1 (4) Anal vein absent.

2 (3) Thorax without any transverse suture ....*Dixa*.

3 (2) Thorax with a transverse suture ....*Ptychoptera*.

4 (1) Anal vein present.

5 (68) Mediastinal vein ending in the costal and connected with the subcostal by the subcostal cross vein; last joint of palpi shorter or not much longer than the two preceding joints taken together............LIMNOBIADÆ.

6 (25) One submarginal cell.

7 (14) Antennæ 14-jointed (empodia indistinct or none) .... *Limnobiinæ*.

8 (13) Proboscis not longer than the head.

9 (12) Antennæ simple.

10 (11) Tip of the mediastinal vein usually far beyond the origin of the præfurca; the ♂ forceps consists of two horny hooks ....*Limnobia*.

11 (10) Tip of the mediastinal vein usually about opposite the origin of the præfurca; the ♂ forceps consists of two fleshy lobes ......*Dicranomyia*.

12 (9) Antennæ pectinate or sub-pectinate .... *Rhipidia*.

13 (8) Proboscis longer than the head and thorax together ... . *Geranomyia.*

14 (7) Antennæ 16-jointed.

15 (22) Subcostal vein ends in the costal; tibiæ without spurs at the tip .. *Rhamphidiinæ.*

16 (17) Proboscis at least twice as long as the head ... . *Rhamphidia.*

17 (16) Proboscis shorter than the head.

18 (19) Discal cell closed .... *Antocha.*

19 (18) Discal cell open.

20 (21) Discal cell coalescent with second posterior cell .... *Orimarga.*

21 (20) Discal cell coalescent with third posterior cell .... *Thaumastoptera.*

22 (15) Subcostal vein usually incurved towards the radial, and ending in it; tibiæ always with spurs at the tips .... *Cylindrotominæ.*

23 (24) Upper vein from discal cell forked .... *Cylindrotoma.*

24 (23) Upper vein from discal cell not forked .. .. *Liogma.*

25 (6) Two submarginal cells (empodia distinct).

26 (43) Tibiæ without spurs at the tip .... *Eriopterinæ.*

27 (34) Wings conspicuously hairy, at any rate along the veins.

28 (29) Wings conspicuously hairy on the whole surface............ *Rhypholophus.*

29 (28) Wings conspicuously hairy on the veins only.

30 (31) The præfurca ends in the first submarginal cell, which is longer than the second; the great cross vein much nearer the base of the wing than the small one is .... *Molophilus.*

31 (30) The præfurca ends in the second submarginal cell, which is longer than the first; the great and small cross veins are nearly in a line.

32 (33) The axillary vein is arcuated so much that the anal cell is broader in its middle than near its margin .... *Erioptera.*

33 (32) The axillary vein is straight, diverging from the anal, so that the anal cell is much broader at its end than in its middle .... *Acyphona.*

34 (27) Wings not conspicuously hairy on the surface, and very slightly on the veins.

35 (38) First submarginal cell remarkably short, not more than half as long as second.

36 (37) Marginal cross vein present .... *Empeda.*

37 (36) Marginal cross vein absent .... *Goniomyia.*

38 (35) First submarginal cell much more than half the length of the second.

39 (42) The subcostal cross vein a long way from the tip of the mediastinal (more than twice the length of the great cross vein).

40 (41) Axillary vein conspicuously bisinuated .... *Symplecta.*

41 (40) Axillary vein straight .... *Trimicra.*

42 (39) The subcostal cross vein is close to the tip of the mediastinal... *Lipsothrix.*

43 (26) Tibiæ with spurs at the tip (even though minute).

44 (61) Subcostal cross vein *after* the origin of the præfurca.

45 (58) Antennæ 16-jointed.. *Limnophilinæ.*

46 (57) Axillary vein nearly straight (not short).

47 (48) An extra cross vein between the mediastinal and costal veins... *Epiphragma.*
48 (47) No extra cross vein between the mediastinal and costal veins.
49 (52) An extra cross vein in the second basal cell.
50 (51) Antennæ long and thin .... *Idioptera.*
51 (50) Antennæ short, very much thickened at the base .... *Ephelia.*
52 (49) No extra cross vein in the second basal cell.
53 (54) Great cross vein almost opposite base of discal cell .... *Dactylolabis.*
54 (53) Great cross vein near middle of discal cell.
55 (56) Wings with numerous dark dots .... *Pœcilostola.*
56 (55) Wings almost without spots .... *Limnophila.*
57 (46) Axillary vein very short, abruptly incurved to anal angle ... *Trichocera.*
58 (45) Antennæ 6—10-jointed .... *Anisomerinæ.*
59 (60) Antennæ apparently 6-jointed (♂), or 10-jointed (♀) ...... *Anisomera.*
60 (59) Antennæ apparently 7-jointed (♂), or 9-jointed (♀)... ..... *Peronecera.*
61 (44) Subcostal cross vein *before* the origin of the præfurca .... *Amalopinæ.*
62 (63) Antennæ 13-jointed .... *Dicranota.*
63 (62) Antennæ 16—17-jointed.
64 (65) Four posterior cells, wings pubescent .... *Ula.*
65 (64) Five posterior cells, wings glabrous.
66 (67) Small cross vein nearly upright; last joint of palpi not longer than two preceding joints taken together .... *Amalopis.*
67 (66) Small cross vein very oblique; last joint of palpi longer than the three preceding joints taken together .... *Pedicia.*
68 (5) Mediastinal vein ending in the subcostal, no cross vein between it and each vein running along side; last joint of the palpi very long, whip-lash shaped, much longer than the three preceding joints taken together .... TIPULIDÆ.
69 (70) Discal cell absent; tibiæ without spurs .... *Dolichopeza.*
70 (69) Discal cell present; tibiæ spurred.
71 (76) Antennæ not pectinated.
72 (73) Antennæ 19-jointed (♂), or 15-jointed (♀) .... *Nephrotoma.*
73 (72) Antennæ 13-jointed.
74 (75) The three veins from the discal cell usually start separate, or the upper two from a common base; yellow and black species ... *Pachyrrhina.*
75 (74) The discal cell emits two veins, the upper one forking at some distance from the cell; not yellow and black species .... *Tipula.*
76 (71) Antennæ pectinated (♂).
77 (78) Antennæ (♂) pectinated only on the inner side .... *Dictenidia.*
78 (77) Antennæ (♂) pectinated inside and outside.
79 (80) Antennæ (♂) pectinated beneath .... *Xiphura.*
80 (79) Antennæ (♂) not pectinated beneath .... *Ctenophora.*

LIMNOBIA.

1 (18) Origin of radial vein far before end of mediastinal vein.
2 (7) Subcostal vein ends with, or before, the cross vein which unites it to the radial vein.

3 (4) Wings without sharply defined spots (and no spots much nearer base than is the origin of radial vein) and with *no* clouds ... *bifasciata*, Schrk.

4 (3) Wings with sharply defined spots (one or more nearer base than is the origin of radial vein) and with numerous clouds.

5 (6) Femora with two sharply defined black rings. (Very large species) *annulus*, Mg.

6 (5) Femora with only one sharply defined terminal black ring... *quadrinotata*, Mg.

7 (2) Subcostal vein continued much beyond the cross vein which unites it to the radial vein.

8 (17) Wings with spots and clouds, or at any rate, three black spots near costa.

9 (14) Thorax chiefly blackish or dark, never shining clear ochreous with a single black middle line. (Wings more or less clouded).

10 (13) Wings clouded all over, with spots near costa somewhat more defined; joints of antennæ elongate, bearing hairs nearly three times as long as each joint (♂), or much longer than joint (♀).

11 (12) Femora with three (or at least two) clearly defined dark rings .. *nubeculosa*, Mg.

12 (11) Femora with only the tip distinctly dark (a pale ring preceding) *flavipes*, F.

13 (10) Wings with slight cloudings, and three blackish spots near costa; joints of antennæ oval, bearing hairs rather longer than each joint... *nitida*, *n. sp.*

14 (9) Thorax shining clear ochreous, with a black middle line in front. (Wings not in the least clouded, but with three dark spots near costa).

15 (16) Front femora black, the basal third luteous ..... *nigropunctata*, Schum.

16 (15) Front femora with only a ring just before the tip black, before which seems to be a paler ring .... *tripunctata*, F.

17 (8) Wings clear, no markings or spots at all................ *trivittata*, Schum.

18 (1) Origin of radial vein nearly opposite end of mediastinal vein... *macrostigma*, Schum.

L. NITIDA, *n. sp.* (♂ ♀).—*Atra, nitida, alis nigro-punctatis et nebulosis, abdomine nigro segmentis quatuor mediis apiceque fulvis, femoribus rufo-flavis, omnibus apice, anticis in medio nigris, tibiis tarsisque obscuris.*

This species must be exceedingly near *L. pannonica*, Kowarz (Verh. z.-b. Wien., xviii, 213), and I should have no doubt that either that or this was *L. analis*, Meig., but for Meigen's positive statement that his *L. analis* was only *L. flavipes*, F.; I know, from specimens in the British Museum, that Walker's *L. analis* is *L. nitida*. It comes between *L. nubeculosa*, Mg., and *flavipes*, F., on the one side, and *L. nigropunctata*, Schum., and *tripunctata*, F., on the other side, but differs from all in its shining black thorax and more darkly marked wings; it is slightly the smallest of all; the black ring on the front femora, and the strongly darkened wing tip, are similar to those in *L. nigropunctata*, but that species has the wing perfectly free from cloudings; from *L. pannonica* I note the following distinctions (according to description):

L. pannonica, Kow.	*L. nitida, n. sp.*
Abdomen and belly shining black.	Abdomen with 3rd, 4th, 5th, and 6th segments above and below almost all reddish-yellow, somewhat darkened at sides and hind margins; on the very edge is a blackish line, which is considerably widened at the hind margins; the end of the 2nd and the base of the 7th segments are also a little reddish-yellow above.
Besides the three blackish spots near the costa, there are similar small spots before the third large spot and at the end of the subcostal vein; venation like *L. tripunctata*.	Wings with three blackish spots placed as in *L. tripunctata*, but much larger, the third almost covering the end of the subcosta, because the continuing part of the subcosta after the cross vein is much shorter than in *L. tripunctata*. No small blackish spots.
Halteres yellow.	Knob of halteres brownish-black.
Antennal joints after the second yellow, darkened at tips.	Antennæ all blackish, except base of third joint.
Scutellum yellowish-brown, darkened on middle.	Scutellum black, with grey tomentum.

L. nitida has the veins all yellow at the base of the wing; the tibiæ are almost black, being only a little brownish about the middle; the black on the 7th and 8th abdominal segments is a conspicuous band between the reddish-yellow middle of the abdomen and the genitalia, these being all reddish-yellow except the black hooks, outside they bear black hairs, but inside near the end yellowish hairs.

Female very similar to the male, but the hind margins of the reddish-yellow abdominal segments are distinctly black; the ovipositor is almost all reddish-yellow.

This does not appear to be rare in England, as in addition to several specimens in the British Museum I came against it many years ago in the Plumstead Marshes when I knew nothing about *Tipulidæ*, and this spring on May 12th it occurred freely in a hedgerow at Exning near Newmarket. It is probably a May species, lasting only a few days; my Plumstead specimens were taken on May 4th.

L. trivittata, Schum.: this species, which is usually considered rare wherever it occurs in Europe, was very abundant on one of the islands in the river at Inverness on July 10th last; on June 26th I took one at Brockdish near Scole in Norfolk, so I suspect it is widely spread but hitherto overlooked. Walker's type of *L. punctigera* is certainly a true *Limnobia*, but when I saw it I did not know *L. trivittata*.

L. macrostigma, Schum.: tolerably abundant near Tunbridge Wells last June.

(*To be continued.*)

NOTES ON THE *LEPIDOPTERA* OF THE BIRMINGHAM DISTRICT: A RETROSPECT.

BY W. HARCOURT BATH.

The ordinary observer could not have failed to notice the changes which have taken place in the Fauna and Flora of the Birmingham District within the last fifty years.

The Fauna and Flora of any country or district are not absolutely identical for any two successive periods, however brief. Some species are gaining ground, others losing it, while yet others remain practically stationary amidst their many fluctuations. These changes are perpetually going on, but *very few of them are placed on record.*

In the course of a few years, the general changes may be inappreciable to the ordinary observer, but, locally, there are often considerable changes which cannot fail to be detected by close scrutiny. These changes are links in the great chain of changes whereby the Fauna and Flora of one geological period are considerably modified and gradually converted into the Fauna and Flora of the succeeding period. But, in the different groups of animals and plants, these changes progress at markedly different rates. Some will change rapidly, while others will hardly change at all.

As a general rule, the change seems to be slowest among the least specialized forms and among those which have been established the longest—the most speedy among the most specialized forms and such as have only lately been introduced.

The *Lepidoptera* in particular have undergone many great and important changes—even during the last few years. The lists of fifty years ago are no longer trustworthy guides.

We have records of many species occurring in the district which are now extinct. Others, which were very plentiful, are now only occasionally seen. Others, again, which were widely distributed throughout the area of the Tame Valley, have become restricted, perhaps, to one or two localities, and so reduced in numbers that we may safely venture to predict that within a few years hence they will be entirely extirpated. On the other hand, there are very few species multiplying their numbers or widening their area of distribution to compensate us for such losses.

I will now proceed to give a few examples to illustrate my argument:—

Not many years ago, probably even within the last fifty or sixty years, the gorgeous swallow-tail *(Papilio Machaon)* used to roam throughout the Midlands.

Now, however, it is entirely restricted to the Fens of Cambridge, Norfolk, and Huntingdon. Another magnificent butterfly, the Purple Emperor *(Apatura Iris)*, used to occur abundantly about fifty years ago in many of the large oak woods with which the district then abounded, but it is now entirely extinct. In this case I think its disappearance may be attributed more to climatic influences than to drainage and cultivation, for its pabulum, the oak, is still very plentiful everywhere.

Within more recent years, the two pretty butterflies, *Melanargia Galathea* and *Lycæna Corydon*, have both become extinct in the only locality which they frequented in the district, namely, at Knowle.

Then again, *Lycæna semiargus* used to occur plentifully at Shirley, and was also taken in Sutton Park by that energetic collector the late Richard Weaver, and others. Mr. Frederick Enock attributed its disappearance in the former locality to the ravages of picture makers. If we can accept, also, the records concerning other captures made by the late Richard Weaver (which I see no reason to doubt), the goddess Fritillary *(Argynnis Dia)* and the Large Copper *(Polyommatus dispar)* used to occur in Sutton Park about fifty or sixty years ago. Concerning the former insect *(A. Dia)*, I have recently been informed by the Rev. Bernard Smith (late of Ascott College), who knew Mr. Weaver personally, that the identity of the insects (two in number) in the cabinet of the fortunate collector was established by a friend, for then Mr. Weaver was only a beginner, having taken up the study of Entomology to benefit his health.

The fraud attributed to him by less fortunate collectors of palming off foreign insects as British is entirely without foundation, as Mr. Weaver did *not* collect foreign insects, for he used to say that the British were more beautiful. (The insular prejudice held its sway in those days).

Mr. Montagu Browne, F.Z.S., Curator of Leicester Museum, informs me that he saw the specimens of *A. Dia* and the single specimen of *P. dispar* in Aston Hall Museum (Birmingham) about ten years ago—the same that were reputed to have been caught in Sutton Park by Mr. Weaver.

The above two *Rhopalocera* are undoubtedly now extinct. There are many species which have become locally extinct or scarce in the district.

The three large Fritillaries, *Argynnis Aglaia*, *A. Paphia*, and *A. Adippe*, used to occur not uncommonly in Sutton Park about thirty or forty years ago, as Mr. Browne informs me, but they are now either extinct or rarely met with there.

Then again, the greasy Fritillary *(Melitæa Aurinia)* used to occur about ten or twelve years ago in several places in Sutton Park. It was most abundant in the bogs near Blackroot Pool, but since the land has been drained, and the Midland Railway cut through, not a single specimen has been seen thereabouts.

The only other locality for this insect in Sutton Park, so far as I am aware, is near Longmore Pool, where a few specimens are annually seen.

There is no doubt that *drainage* and *cultivation* are the principal causes of the extirpation of many insects. Another butterfly, the Common Blue *(Lycæna Icarus)*, used to occur abundantly in one spot near the Keeper's Pool, but about 10 years ago it suddenly vanished and not a single specimen has been seen in the Park since. The insect occurs in the fields in the neighbourhood of Sutton Coldfield, but is very rare. Its relative, the Holly Blue *(Lycæna Argiolus)*, formerly enjoyed a much wider distribution than it does at the present day, for we have records of its having occurred in Coventry, Bromsgrove, and many other places, but the only locality for it now in the neighbourhood of Birmingham is Sutton Park.

This famous pleasure resort for the Birmingham public seems to have been a much finer hunting ground for the entomologist than it is at the present day, in fact, only a few years ago there were many butterflies which were found in tolerable plentifulness, but which are now seldom seen there. The most noticeable are, perhaps, *Gonepteryx rhamni*, *Vanessa Io*, *Pararge Megæra*, and *Epinephele Janira*. The two latter I believe are almost extinct. I have only taken a single specimen of *E. Janira* within recent years, and that one I captured in the marshes near Blackroot Pool, in 1883. Its singular absence in the neighbourhood of Sutton Coldfield is worthy of remark, being a very common butterfly in most districts throughout the Midlands. The beautiful Emperor Moth *(Saturnia pavonia)* also used to be very plentiful in Sutton Park about ten years ago, but it is now comparatively scarce. This may be attributed to two causes: 1, to the extensive fires which have recently raged in parts of the Common where the insect was most plentiful; 2, to the greediness of collectors and rapacious picture dealers who take every specimen they come across.

On the other hand we have very few insects becoming abundant to compensate us for this "falling off," still, there are some species which are apparently becoming more plentiful and widening their area of distribution. The most important are, perhaps, *Colias Edusa* and *C. Hyale*. Not many years ago both these insects were looked upon as great rarities. They are now, however, probably to be met with somewhere in the district every season. In 1877 they both occurred throughout the Midlands in great abundance. I think their increase may be attributed to the same influence which is acting the reverse with such a number of other species, namely, cultivation—the extended cultivation of various tracts of clover by agriculturists, this plant constituting the pabulum of both species. In this country *C. Edusa* occurs more commonly than *C. Hyale*, the reverse being the case on the continent.

The great Death's Head Moth *(Acherontia Atropos)* is another insect which is becoming more plentiful with us and increasing its area of distribution. Then there is the Alder Moth *(Acronycta alni)* which formerly was regarded as a rarity of the first magnitude, but which has now become of sufficient plenty for almost every collector to be in possession of one or more in his cabinet.

The fact of many rare *Sphingidæ* having of late years been taken in the immediate neighbourhood of Birmingham, such as *Deilephila lineata*, *Chœrocampa celerio*, *C. nerii*, and other austral forms may be referred to their being introduced at various times with foreign greenhouse plants.

The remarkable *fluctuations* in the appearance of many insects would afford a fertile topic in itself. During a certain year a particular insect suddenly becomes abundant, though for several years previously it may have been very rare and only occasionally seen. In 1884 the Red Admiral *(Vanessa Atalanta)* occurred throughout the district in the utmost profusion, though for several years previously it had been comparatively scarce. In the same year, too, our gardens were visited by an innumerable horde of the Large Whites *(Pieris brassicæ)*, though for several years it had been very scarce. Other *Lepidoptera* which I have noticed to greatly fluctuate in their appearance are *Vanessa cardui*, *Porthesia similis*, and *Plusia gamma*, all of which occurred in unusual abundance in the neighbourhood of Birmingham in the autumn of 1879.

The Gold Tail Moth *(P. similis)* was so plentiful in the neighbourhood of Perry Barr that it covered the hedgerows like "flakes of snow." Since 1879 all these insects have been much less plentiful.

With respect to *V. cardui* and *P. gamma*, their unusual abundance in 1879 seemed to have been general throughout the British Isles, for correspondents in Ireland and the north of Scotland inform me that both species were very abundant there during the same year.

Now I am inclined to think that a considerable percentage of the unusual and sudden appearances of particular insects are referable to *migration.*

Vanessa cardui is an insect which possesses a very wide area of distribution, being found in nearly every country in the globe. It is one of those insects in which a strong migratory instinct appears to be developed. Gathering together in enormous clouds they quit the place of their birth and depart in search of "fresh fields and pastures new."

The Painted Lady is a butterfly that produces two broods in the year, and hibernates in the perfect state. When one of these large migratory hordes reaches this country it generally appears to be composed of those insects that have hibernated such hordes reach our shores in June or about that time.

If the swarm is a large one the butterflies spread over the Island, if, on the other hand, the swarm is a small one, the range is more restricted.

The butterflies then breed and die. The first brood is produced in August when the imagines again in their turn deposit ova on the thistles, and die. In our British climate, thistles and kindred plants die early in the autumn, and before the *larvæ* can feed them on the chilly nights have withered the food plants. Starved with cold and hunger, the *larvæ* fall victims to our climate, so that the second brood which ought to live over the winter to continue the race over another year never reaches maturity, and the species disappears. It may happen, however, sometimes that a few of the first brood emerge so late that they hibernate or emerge so early that the progeny passes through the various stages and does the same. Either of these occurrences would carry the race on for another season, but it does not seem possible for this to last more than a year or two. The species is then lost until a fresh migration makes it abundant once more. *Vanessa Antiopa* is another insect whose phenomenal appearances may in my opinion be referable to the same theory of migration, although the differences in colour between British and Continental specimens require a little investigation.

There are many other insects which, independent of migration, appear sometimes in immense numbers locally, such as *Lobophora viretata*, *Thecla rubi*, and other local species which are usually the reverse of abundant. Then again, others which are usually tolerably abundant, such as *Polyommatus Phlæas*, *Euchloë cardamines*, and *Pieris napi* are very scarce in certain seasons.

The recent progress of science forcibly teaches us that the grandest and safest conclusions are best attainable by means of the most minutely accurate observations persistently conducted according to some well arranged and comprehensive plan.

In the cases above cited, numberless experiments are being carried out before our eyes, and, if we are to profit by them, we must watch them with the closeness of vision and keenness of intellect demanded by the physicist in his laboratory.

The Limes, Sutton Coldfield: *October* 11*th*, 1886.

NOTES ON THE *COLEOPTERA* OF THE ISLE OF SHEPPEY.

BY G. C. CHAMPION, F.E.S.

For the last eighteen years, except when absent abroad, Mr. J. J. Walker and I have paid a great deal of attention to the Coleopterous fauna of the Isle of Sheppey. Our list contains at present about 900 species. The island is, or used to be, rich in salt-marsh frequenting species. Having spent the greater part of the month of August, part of the time in company with Mr. Walker, in the island, I have again had an opportunity, after a lapse of several years, of paying a little more attention to the subject. The following species, among others, were met with and seem noteworthy; those marked * have not hitherto been recorded from, or are noted by us for the first time in the island.

Cillenum laterale:* sparingly, under stones below high-water mark.

Helophorus intermedius: this species used to abound in the brackish ditches; latterly I have only seen it crawling on the esplanade, not uncommonly.

Ochthebius exaratus: not uncommon, in company with three other species of the genus, in fresh or brackish ditches.

Cercyon aquaticus:* rarely, in the above-mentioned "traps."

Homalota perexigua: sparingly, by evening sweeping on the edge of the cliffs, and also from rubbish on the banks of the ditches; this tiny little species is found in company with *H. inquinula* (and numerous other species of the genus), and is difficult to detect in the net amongst the larger common species. *H. cæsula*:* not uncommon in one little sandy spot; in short moss, as at Deal and elsewhere.

Diglossa mersa:* rather common, beneath large boulders on the beach, and below high-water mark.

Myllæna elongata:* rarely, on the banks of the ditches.

Philonthus punctus:* rarely, in two widely separated localities; in "traps" of water plants pulled out of the fresh water ditches and left a few days to dry on the banks, and in a partially dried up reedy piece of marsh ground. This is the first time I have seen the species alive, though the insect is a known inhabitant of the island; we had long been looking for it.

Homalium pygmæum:* one example, evening sweeping.

Actidium coarctatum:* not uncommonly, in company with *Diglossa*, and also beneath seaweed.

Hydnobius strigosus,* *Anisotoma calcarata*, *Cyrtusa pauxilla*,* and *Colon brunneum*: rarely, by evening sweeping on the edge of the cliffs.

Syncalypta hirsuta: rarely, by evening sweeping.

*Throscus carinifrons** and *obtusus*: the first-named not uncommonly, the latter rarely, by sweeping just before dark (not earlier) along the edge of the cliffs. The four British species of the genus are now known to us from the island.

Xylophilus populneus :* rarely, by evening sweeping.

Salpingus ater :* two examples, evening sweeping on the edge of the cliffs. This insect seems to occur sporadically in widely separated localities. Visiting Sittingbourne a short time after, we again met with a pair of the species.

Bagoüs subcarinatus and *frit*: not uncommonly, beneath "traps" (*Ranunculus aquaticus*, *Lemna*, &c.) on the banks of fresh water ditches. Of the hundreds of specimens we have captured of the five species of *Bagoüs* inhabiting the island, by far the majority have been found by this method or in flood refuse; it is only on rare occasions we have found them by sweeping or in the water net. *B. subcarinatus* can always be identified amongst its British allies by its long and slender tarsi.

Trachyphlœus alternans :* rarely, in a little sandy spot. This is another species occurring more or less sporadically (though often found in numbers) in very many localities in the South of England, both on the chalk and on the sand.

Apion limonii: in profusion, in a new and distant locality, at Leysdown. This species had long since disappeared from its old locality near Sheerness; it selects saltings not covered by high tides. The withered state of the leaves of its food-plant will generally indicate its presence.

Apion Schönherri: a single example, by sweeping. This species was formerly found by us in profusion in moss, &c., on the banks of fresh water ditches, in winter; very rarely in the summer months single specimens have occurred by sweeping.

Hæmonia Curtisi: rarely, in slightly brackish ditches, on *Potamogeton pectinatus*.

Engis humeralis: rarely, in fungus on elms, in company with swarms of *Mycetophagus quadripustulatus* and *Triphyllus suturalis*. In the New Forest, I have only found this species in fungoid growth on beech.

Just before sunset on calm evenings, or, better still, when there is a slight breeze from the land, enormous numbers of the commonest beetles may be found by sweeping along the extreme edge of the cliffs, and amongst these now and then rarer species are to be met with, the difficulty being to detect amongst such a struggling mass of life any small or obscure forms. The most abundant species belong to the genera *Sitones*, *Apion*, *Atomaria*, *Bradycellus*, *Trechus*, *Oxytelus*, *Homalium*, *Lagria*, *Meligethes*, *Phalacrus*, *Cercyon*, *Typhæa*, *Aleochara*, *Olibrus*, *Orthoperus*, *Lathridius*, *Stenus*, *Bruchus*, *Homalota*, *Ceuthorhynchus*, *Lithocharis*, *Psylliodes*, *Corticaria*, *Philonthus*, *Philhydrus*, &c., &c.; more rarely, *Leucoparyphus*, *Helophorus*; we have obtained, in addition to those already mentioned, *Haploglossa*, *Hylobius* (!), *Autalia rivularis*, *Apion pubescens*, *Cionus blattariæ* (for the first time in Sheppey), *Ochina*, &c. Many visits in search of *Baridius scolopaceus* were quite fruitless; the insect appears to have become extinct in its old locality.

11, Caldervale Road, Clapham, S.W.:
September 25th, 1886.

DESCRIPTION OF THE LARVA OF *PTEROPHORUS ACANTHODACTYLUS.*

BY G. T. PORRITT, F.L.S.

At page 149 of the last (xxii) volume of the Ent. Mo. Mag., is a description of the larva of *Pterophorus cosmodactylus* ; a reference to it will show that in the year 1884, Mr. Eustace R. Bankes, of Corfe Castle, sent me about a score of larvæ of a *Pterophorus*, from which I bred a series of *cosmodactylus* and two specimens of *acanthodactylus*. Last year, Mr. Bankes sent me another lot of larvæ, from which I bred *cosmodactylus* only. Notwithstanding this large proportion of *cosmodactylus*, Mr. Bankes has all along been convinced that in reality *acanthodactylus* is much the commoner insect in his district ; and, therefore, again this year collected and sent me thirteen more larvæ from the *Stachys sylvatica*. They reached me on August 25th, and, on opening the box, at first sight they appeared to me just like those received the two previous years ; they were of the same shape, and there was precisely the same range of variation from the bright green to purple forms. Two days afterwards, however, on comparing them closely with my descriptions of the previous years' larvæ, it at once became apparent that there were distinctly defined distinctions between them ; so much so, that I at once wrote to Mr. Bankes stating I fully expected to breed *acanthodactylus* from them. On the 7th of September a further consignment of larvæ reached me from my friend Mr. W. H. B. Fletcher, of Worthing, who sent them (evidently without any doubt on his part) as *acanthodactylus*. They seemed in every respect like Mr. Bankes' larvæ, so that I was now all but certain it would be proved these two closely allied species can be separated in the larval stage. The result was perfectly satisfactory, for from Mr. Bankes' larvæ I bred thirteen *acanthodactylus*, from September 7th to 14th ; and from Mr. Fletcher's, five specimens, the first appearing on September 21st. It seems almost inexplicable that this year Mr. Bankes should collect no *cosmodactylus* larvæ whatever, for he retained a good many himself, and when writing me early in September, he had up to that time bred forty specimens—all *acanthodactylus* !

Description.—In shape exactly like that of *cosmodactylus*, as described in the Ent. Mo. Mag., xxii, 150. As in that species there are two distinct forms, and intermediate varieties occur partaking more or less of each of these extreme forms :—

Var. I has the ground colour deep purple ; head yellowish-grey, or yellowish-brown, marked on the crown and sides with black, the mandibles brown ; medio-dorsal stripe smoke-coloured ; sub-dorsal lines, and another line of equal width below it, white, but interrupted and not very conspicuous; and below these is another scarcely so pale line along the spiracles; hairs and the distinct tubercles white. Ventral surface and prolegs greenish-olive, anterior-legs shining black, ringed with paler.

Var. II has the ground-colour bright pale green; head as in Var. I; the pulsating dark smoky vessel—in some specimens tinged with pink anteriorly—forms the dorsal stripe; sub-dorsal lines indistinct, whitish; below these is another line, but much interrupted and broken into short lengths; there are no lines along the spiracular region; hairs and tubercles white. Ventral surface and prolegs of the bright green of the dorsal area, the legs shining black, ringed with white.

From the foregoing it will be noted, that the chief points of distinction between this insect and *cosmodactylus*—distinctions which will probably be found to be reliable—are: the deep purple ground-colour in *acanthodactylus*, as compared with the "purplish-pink" of *cosmodactylus*; the white sub-dorsal lines being less conspicuous in *acanthodactylus*; and the head being yellowish-brown marked with black, in place of the "very dark sienna-brown, almost black," in *cosmodactylus*.

Huddersfield: *October 8th*, 1886.

A LUMINOUS INSECT-LARVA IN NEW ZEALAND.

BY C. R. OSTEN-SACKEN, HON. F.E.S.

Mr. Hudson's account (*ante*, pp. 99–100) about the luminous insect-larva from New Zealand leaves me very little doubt that it belongs to the *Mycetophilidæ*. The description of the "glutinous web," the rapid motions of the larvæ gliding upon it, and their retreat into holes, when alarmed, show a remarkable agreement with my observations on the larvæ of *Sciophila*, described in detail in my article: "Characters of the larvæ of the *Mycetophilidæ*," in the Proceedings Entom. Soc. Philad., 1862 (I have recently reprinted this article as a separate pamphlet for distribution among my correspondents). Whether my *Sciophila* larvæ were shining or not, I can neither affirm nor deny, because I do not remember seeing them in the dark. But we have another observation of luminous larvæ of *Mycetophilidæ*, that of Wahlberg, Act. Holm., 1838 and 48. He observed the transformations of *Ceroplatus sesioides*, and saw larva and pupa, but not the perfect insect, emit a bright light. His paper will be found translated in the Stett. Ent. Zeit., 1849, pp. 120—123. There is no doubt now that the fly *Trimicra pilipes* was bred from some other larva hidden in the mud which contained the luminous larvæ; one of the "small earthworms" mentioned may have been that very larva. To make assurance doubly sure, I wrote to Mr. Theod. Beling, in Seesen (in the Harz mountains), who reared larvæ of *Trimicra*, and published descriptions; upon my suggestion he took the trouble to hunt up such larvæ again, as they were in season, and to watch them in the dark; no trace of luminosity was visible. Thus it remains only to ascertain to what genus of *Mycetophilidæ* the New Zealand larvæ belong.

I notice, by the way, that in my statement about luminous *Diptera*, in the Ent. Mo. Mag., xv, p. 43, I forgot to mention Wahlberg's observation.

Heidelberg: *October*, 1886.

Aculeate Hymenoptera in 1886.—As I have been successful in capturing a considerable number of scarce and local *Hymenoptera*, a record of some of the best of these may not prove to be without interest. During May and the greater part of June I was at Oxford; the last two or three days of July and the first ten days of August I spent at Sidmouth. To species that were found in these two localities I shall affix the name of the locality where I found them; where no locality is mentioned, it is to be understood that the species was caught within walking distance of Chippenham.

As no really scarce species of the *Heterogyna* was found, I record none of this section. Of the *Fossores* I have taken—

Myrmosa melanocephala, Fab.: two ♂ and several ♀; the latter sex also at Sidmouth.

Aporus unicolor, Spin.—of this rare species I was lucky enough to take one ♀ at Sidmouth.

Evagethes bicolor, Lep.—one ♀ at Sidmouth.

Of the genus *Pompilus*: *niger*, Fab., was common, but so difficult to catch, that I only secured about half a dozen—I took a single ♂ at Sidmouth; *spissus*, Schiödte, was generally common in our woods.

Priocnemis was very well represented, several good species being found: *fuscus*, Linn., at Oxford; *exaltatus*, Fab., common at Sidmouth; *pusillus*, Schiödte, both sexes, but not commonly; *parvulus*, Dahlb., both sexes, rarely; *hyalinatus*, Fab., one ♂ at Sidmouth.

Agenia variegata, Linn.—widely distributed, but not very common; it is to be found running over walls, heaps of road-scrapings, banks, on willow and other tree trunks, and on old stumps. I have taken ♂ and ♀ *in cop.*, and the latter sex with its prey (a spider), as is usual with the *Pompilidæ*: *hircana*, Fab., much more local than the former species, but not very scarce where it is found. I have only taken it on tree trunks, and once or twice on a stump.

Ceropales maculatus, Fab.—not uncommon in woods.

Astata boops, Schr.—I found the ♀ with its prey at Sidmouth.

Spilomena troglodytes, V. d. Lind.—two ♀ in a quarry.

Mimesa Dahlbomi, Wesm.—in the woods, but not commonly.

Crabro clavipes, Linn.—this species and several others seem particularly fond of plum leaves in gardens. I suspect that they come in search of the *Aphides*, which are often so abundant on these trees; *capitosus*, Shuck.—the ♂ was found in our garden; *gonager*, St. Farg.—I took three or four ♂ and a few ♀ at Wootton-under-Edge, near here, where the first specimens were taken. I was very pleased to find a new locality about twelve miles from the original one, where I took several ♀. At Wootton it forms its burrow in decaying stumps, in the new place in a stiff clay soil; *interruptus*, De Geer—I found only one ♀ of this uncommon species.

Odynerus pictus, Curt., was not very common, and *antilope*, Panz., even less so.

Many scarce species of the *Anthophila* were found. Among the *Andrenidæ*: *Prosopis confusa*, Nyl., was not rare on bramble blossoms in woods; *brevicornis*, Nyl., was less common, but was also found at Sidmouth, where I also took the ♂ of *P. pictipes*, Nyl.

Nearly all the species of the genus *Sphecodes* were taken, including *S. puncticeps*, Thoms., at Sidmouth; *S. ferruginatus*, Thoms., which occurred here in thousands and tens of thousands. In several places, where patches of *Carduus arvensis* grew, they could have been boxed in innumerable quantities after sundown on warm evenings, five or six specimens being found on every blossom. The ♀ I took at Oxford in the spring. *S. hyalinatus*, Thoms., not quite so plentiful, but very abundant on the same thistle flowers. I took several females of this species at Oxford. *S. variegatus*, Von Hag., with the preceding, but far less plentiful; I could only secure about two dozen. *S. dimidiatus*, Von Hag., fairly common at Oxford, but of course I only took the hibernated females. *S. affinis*, Von Hag., more or less common in both places.

Andrena, Fab., was very well represented: *Hattorfiana*, Fab., 1 ♂ and 5 ♀ on flowers of the common Scabious at Sidmouth; *Cetii*, Schr., 1 ♂ and 1 ♀ on the same flowers in the same place; *pilipes*, Fab., was common at Sidmouth on bramble blossoms: *rosæ*, Panz., was not plentiful there, on the same flowers; *thoracica*, Fab., swarmed on nearly every flower, thistle, bramble, crepis, fleabane, and many others; *angustior*, Kirb., I took 1 ♂ and 11 ♀ of this rare species at Oxford, all the females had their legs covered with pollen, and occurred solely on the common buttercup; *bicolor*, Fab., is a common species, it is very partial to mallow blossoms and *Crepis*; *varians*, Rossi, *helvola*, Linn.—the ♂ of the former and ♀ of the latter were taken at Oxford; *fucata*, Sm., 5 ♀ at Oxford, all on whitethorn blossom; *simillima*, Sm., 2 ♂ and 8 or 9 ♀ at Sidmouth. These were chiefly taken on *Carduus arvensis*, but also on *Inula* and other flowers; *denticulata*, Kirb., both sexes at Sidmouth, but not very plentifully; *chrysosceles*, Kirb., in countless numbers in the spring, and abundant at Oxford; *humilis*, Imh., very locally at Oxford, but abundant in one place; *dorsata*, Kirb., 2 ♀ at Sidmouth on bramble blossoms; *Wilkella*, Kirb., at Oxford, very locally.

Cilissa hæmorrhoidalis, Fab.—the males of this species were very abundant when I left for Sidmouth, but I only took 8 ♀; on my return they were past. It is not at all confined to the harebell; in the woods and on the hills it is found on the three species of mallow, the harebell, and the Canterbury bell; in lanes abundantly on *Geranium Robertianum*, in company with *Andrena bicolor*, Fab., *Chelostoma campanularum*, Kirb., &c. It is much preyed upon by a spider which infests these flowers, and which rushes out and strangles it as it alights.

Of the *Apidæ*, both species of *Panurgus* occurred at Sidmouth. I took a single ♀ of *Nomada ochrostoma*, Kirb., here, at Oxford it was not rare; in both places it was parasitic on *Andrena Afzeliella*, Kirb., not on *A. labialis*, Kirb. *N. obtusifrons*, Nyl., 2 ♀ at Sidmouth, one on *Senecio* and the other on *Carduus*. *N. ferruginata*, Kirb., not rare at Oxford, with *A. humilis*, Imh. *Stelis phæoptera*, Kirb., 1 ♀ at Sidmouth; I cut it out of a burrow that was constructed in a gate post; this was on the first day of my stay while it was raining fast.

Osmia pilicornis, Sm., 1 ♂ and 4 ♀. It burrows in dead wood and in stony ground; it is a very early spring bee, found in April on dog violet, &c., but the ♀ may be found till quite the end of June. I took one of the latter sex at Oxford on the common bugle by the road side: *fulviventris*, Panz., not uncommon in our garden; it cuts *decayed* rose leaves in a very ragged fashion, very unlike the neat work of a *Megachile*; it builds in the holes where nails have fallen out from the mortar of our garden wall: *bicolor*, Schk., 6 or 7 of each sex on dog violet, bluebell, cistus, and wood anemone: *O. leucomelana*, Kirb., 2 ♂ and 5 ♀ at Sidmouth; the ♂ settles on the bare pathways, the ♀ I only found on *Crepis*; I found one *nidus* in a buried bramble stem; unfortunately, not more than one or two cells are full, and perhaps not even these: *spinulosa*, Kirb., not very plentiful at Sidmouth.

Anthophora furcata, Panz., 4 ♀ at Sidmouth.

Saropoda bimaculata, Panz., not uncommon at Sidmouth, always on *Centaurea nigra*.

All the species of *Psithyrus* occurred, the males at any rate.

The best *Bombus* was *distinguendus*, Mor., of which 2 ♂, 1 ☿, and 1 ♀ were found.

I found stylopised specimens of *A. fulva*, Schr., ♂. *A. nana*, Kirb., ♀ at Oxford and here, and of *Halictus tumulorum*, Linn., ♂ frequently.

In conclusion, I must state that Mr. Edward Saunders has very kindly named for me a very great number of the more puzzling of these species.—ROBT. C. L. PERKINS, Sopworth Rectory, Chippenham, and Jesus College, Oxford: *Sept.*, 1886.

Chrysis ignita preyed upon by Xysticus cristatus.—On 4th September last in Grisel-bottom—a valley adjoining Burwell Wood near Louth in Lincolnshire—I observed a spider, *Xysticus cristatus*, Clk., on the sweetly-scented yellow flowers of the agrimony *(Agrimonia eupatoria)*, preying upon a *Chrysis ignita*. This lovely little insect, which is able to roll itself up in a ball when alarmed, had been overcome by the skill of the *Xysticus*.—H. WALLIS KEW, Louth, Lincolnshire: *Oct. 6th*, 1886.

Note on some Bees and the flowers of Snapdragons.—Having this year a great quantity of *Antirrhinum majus* growing together, I have made, during the month of August, many and continuous observations of the behaviour of some kinds of bees with the flowers, which in the main corroborate those of the late Mr. E. Newman, communicated to the Entomological Society (Proceed., 1850, p. 36). He enumerates 4 kinds, but names only one (No. 1), designating the others as "*Bombus* —— ?" with numbers 2 to 4; these numbers I adopt here, assuming from the identity of proceeding in the bees I have seen with that recorded by Mr. Newman that the kinds are the same; the specific names of these, and also of Nos. 5 to 7, have been kindly furnished by Mr. Edward Saunders from individuals taken in the acts mentioned.

No. 1. *Megachile centuncularis.*—This I have not seen; it is said to enter the flowers back downwards.

No. 2. *Bombus Derhamellus*, ☿.—This invariably enters the flowers back upwards, going in so completely as to be entirely hidden, and no entomological Dogberry on day duty would suspect its presence. However, it soon comes out, its thorax striped with yellow pollen from the anthers, which it at once carries to fertilize another flower, and so on again and again: "*Sic vos non vobis*" may well be said of such bees as this, which thus unconsciously have contrived a double debt to pay. Mr. Newman believed this bee to be the neuter of No. 4, and this was correct if my No. 4 be the same, of which there may be a doubt (see No. 7).

No. 3. *Bombus terrestris*, var. *lucorum*, ☿.—This does not enter the flower at all. Mr. Newman says it alights on the flower stalk just below the flower, cuts a hole in the corolla close to the nectary and thrusts its tongue or labial apparatus through this to the nectary. I have, however, often seen it not only act thus, but also alight on the flower, yet never attempt to enter it, but crawl at once down the outside to the base of the corolla. I thought the size of the bee might have been against its entry, but as I afterwards saw larger bees go in, this theory was defective, it therefore appeared that it sought honey only and took the readiest way to get it. I saw no ♀ of this var.

No. 4. *Bombus Derhamellus*, ♀.—This large bee was of too great a size to get into the flower, so standing on the lower lip it opened the mouth of the corolla and thrusting itself in as far as it could thus reached the nectary, as could be seen through the sides of the tube, the posterior part of the body remaining exposed to view; when the bee came out the thorax was marked with pollen like No. 2, the ☿.

No. 5. *Apis mellifica* (Ligurian race). This (not mentioned by Newman) goes on the outside of the flower from below and proceeds to extract the honey like No. 3. Simultaneously, however, I saw other bees of this species go to the mouth of the corolla and open it, but they did not enter; they only stood on the lower lip and pushed their heads in; and I repeatedly noticed that they reached only to the polleniferous anthers with their fore-legs; so it was clear they required pollen only. I further noticed that the honey collectors went from flower to flower always on the same errand, and that the pollen gatherers acted similarly, neither taking up the occupation of the other. Here was clearly an economic division of labour.

No. 6. *Bombus terrestris*, var. *virginalis*, ☿.—This settled on the lower lip of the flower and pushed itself into the corolla as far as it could, leaving a considerable portion of its abdomen and its hind-legs in sight: this I saw repeatedly. It evidently went to the nectary for honey, for the pollen from the anthers remained thick on the thorax and was regarded as an encumbrance, as the bee occasionally rested on a leaf and did its best to get rid of the dust with its fore-legs. If it had intended to gather pollen it would not have acted in this way. It is very singular that to get the honey the procedure was so different from that of No. 3—another variety of the same species.

No. 7. *Bombus terrestris*, var. *virginalis*, ♀.—This also settled on the lower lip of the flower, and thrust itself as far as it could into the corolla, but being the largest of all the bees the whole of the abdomen remained in view. It evidently reached the nectary with its tongue; honey was the object of its action, for the pollen formed a large stripe on the thorax, and efforts like those of No. 6 were made to remove it. This may have been the "very large bee" mentioned by Newman as his No 4, in which case his belief that it was the ♀ of No. 2 was incorrect.

I did not in any instance see either No. 3 or No. 5 make the hole which always existed at the base of the corolla after a bee had examined it, and so the opening once made served for every successive visitor. In Hermann Müller's work, "The Fertilization of Flowers,"* at page 433, the fertilization of *Antirrhinum majus* by various bees is noticed, but in every case quoted the bee entered the corolla. This is the more singular, as it is said, with respect to the flowers of the allied *Linaria vulgaris*, "I have seen the honey-bee bite a hole in the spur and empty it, as Sprengel describes."

Nos. 2, 3 and 4 disappeared after the 3rd of September, at least they then came no more to the snapdragons.

The flowers exhibited countless shades and combinations of colours, from pure white to crimson, including spots and stripes, but the bees had no preference for any, going indiscriminately from one to the other.—J. W. Douglas, 8, Beaufort Gardens, Lewisham: *Sept. 10th*, 1886.

Agrypnia Pagetana, Curt., and other Trichoptera in Ireland.—Referring to the note on *Trichoptera* from Co. Monaghan, Ireland, vol. xx, p. 142, I have again received from Miss Freeland small collections made there during the present and last summer. These include a number of *Agrypnia Pagetana*, Curt., which occurred commonly about the end of July. They differ little from specimens out of the English Fen country; their aspect is, if anything, darker. The extension of the geographical range of this species so far westward as Ireland, is interesting: for a long time it was known, as British, only from the eastern parts of England and Scotland, but quite recently it was recorded from Clydesdale.

Other species not mentioned in my former note are: *Phryganea varia*, F.; *Limnophilus affinis*, Curt.; *Sericostoma personatum*, Spence; *Goëra pilosa*, F.; *Leptocerus albifrons*, L.; *Triænodes bicolor*, Curt.; *Œcetis lacustris*, Pictet; and *Holocentropus dubius*, Ramb.

Œcetis furva, Ramb., is again represented, this time by about thirty examples (♂ and ♀).—Kenneth J. Morton, Carluke, N.B.: *September 8th*, 1886.

Micromus aphidivorus, Schrk. (angulatus, Steph.), near London.—My friend Mr. E. Saunders recently gave me a specimen of this little Hemerobid that he had beaten from *Pinus sylvestris* at West Wickham, on the 18th ult. It is one of the rarest of the British *Hemerobiidæ*, and is here essentially sporadic, but of wide distribution, and only taken singly. I possess two other native examples, both dating from 1863: one taken by Mr. J. B. Hodgkinson at Witherslack, in the Lake District, the other near Worcester, by the late Rev. E. Horton. Stephens gave "near London," and Scotland as localities. I have seen others, but very few. On the continent its distribution is very wide, and it is often not uncommon. It occurs also in North America: I have an example from Mt. Washington in New Hampshire that is not separable from European specimens. I follow Hagen's old nomenclature in using Schrank's name, but the latter's description is very vague, and might apply to other species better than to this. Stephens' name *angulatus* should probably prevail.

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* The Fertilization of Flowers. By Prof. Hermann Müller. Translated and edited by D'Arcy W. Thompson, B.A. London: Macmillan, 1883.

The other British *Hemerobiidæ* that remain essentially rare are *Psectra diptera* (known only by the unique example captured by the late Mr. J. C. Dale in 1813), *Megalomus hirtus*, and *Drepanopteryx phalænoides* (I understand from Messrs. Morton and King that search for the latter species in the locality where three specimens were found last year, has been fruitless).—R. McLachlan, Lewisham, London: *October 13th*, 1886.

The distribution of the Lepidoptera in the British Isles.—As I am compiling notes for a work on this subject, I shall be very glad of local lists of *Lepidoptera*, which, however incomplete, will be useful to me. Readers of the Ent. Mo. Mag. are requested to assist me in this desideratum. Full particulars may be had on application to—W. Harcourt Bath, The Limes, Sutton Coldfield, Birmingham: *October 11th*, 1886.

Lepidoptera, and the sense of hearing.—Will any reader of the Ent. Mo. Mag. kindly inform me upon what grounds are the antennæ of *Lepidoptera* assumed to be the organs of hearing? I think the sense of hearing in *Lepidoptera* cannot be very keen, as gathered from the fact that they seldom evince any emotion at a sound, however loud, and then when they do move I am inclined to believe that it is merely the concussion of the air which induces them to do so.* I once fired a rifle for experiment close to a butterfly and it failed to take any notice of the report—was this either through fear, indifference, or because it did not hear it? What proofs are there that *Lepidoptera* can hear?—Id.

Wasps and hornets in the Midlands.—This autumn there has been a great scarcity of wasps throughout the Midlands. In the spring, however, the females were very abundant, but it is probable that the quantity of wet experienced in April and May prevented them colonising. Stone fruit has been marvellously plentiful this year, and has been gathered in excellent condition on account of the absence of these fruit pests. It is remarkable how scarce hornets have become in the Midlands within the last few years. About ten or twelve years ago they were very abundant: I remember seeing a very large colony in Sutton Park, but have not observed a single specimen since.—Id.

A plague of Aphides in the Midlands.—The first week of October was abnormally warm in the Birmingham district, and favoured the development of innumerable swarms of *Aphides* (principally *Aphis nigra*), which caused great annoyance to many people as they filled the air with their multitudes. The swallows, which have not yet all left us, have been making a very big feed the last few days. Yesterday, however, we had a rather heavy thunderstorm, and also a quantity of rain during the day, which has washed the *Aphides* nearly all away. The weather, too, has become much colder, so that the insects are not likely to make a re-appearance this year.—Id.

Drymus pilicornis and other Hemiptera in the Isle of Sheppey.—The following species of *Hemiptera* have been obtained:—*Drymus pilicornis*: a single example, by evening sweeping at the edge of the cliffs; this very rare British species I once found at Hurst, Sussex, and again, subsequently, at Caterham. *Rhyparochromus sabulicola*: sparingly, in short moss, in a sandy place. *Miridius quadrivirgatus*: sweeping along the cliffs, rarely. *Teratocoris antennatus*: both sexes, rarely, by sweeping *Arundo*, *Carex*, *Juncus*, &c., in a partially dried up piece of marsh ground. *Nabis lineatus*: not uncommonly, with the preceding. *Cardiastethus testaceus*: a single example, by evening sweeping at the edge of the cliffs.—G. C. Champion, 11, Caldervale Road, Clapham: *September 28th*, 1886.

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* Slightly vague. We presume our correspondent refers to a general "shock," in contradistinction to action on any special auditory organ.—Eds.

Pachytylus migratorius, Linné, in Lincolnshire.—Yesterday I received for identification a living female *P. migratorius*, L., from Mr. H. Wallis Kew, of Louth, Lincolnshire, who asks me to record its capture. It was said to have been taken in a field of stubble at Withern, eight miles from Louth, and was brought by a little girl to the local taxidermist, from whom Mr. Wallis Kew obtained it.—Eland Shaw, St. Mary's Hospital, W.: *Oct. 16th*, 1886.

On the moulting of the larvæ of Pygæra bucephala.—I have lately had an opportunity of seeing a batch of these larvæ undergoing their last moult, and was much struck with the prolonged interval which elapsed between their being laid up for the moult and the actual transformation taking place.

It was on Thursday, September 16th, that I first noticed the larvæ; they were then taking up their position on an oak-twig, which was most conveniently situated, as it was just the right height for the eye, and it was in a place that I habitually passed a dozen times a day.

On the Friday, September 17th, the larvæ were all fixed in position, and I could see by the amount of silken carpet spread over the leaves that moulting was intended. They remained in this state all Saturday, all Sunday, and all Monday, except that on the Monday one solitary individual banged its head about from side to side, which I thought was a hopeful symptom. On Tuesday morning I must confess I was somewhat surprised that not a single larva had yet moulted, though they had begun to take up their position the previous Thursday, and, of course, had not tasted food since then.

Shortly after noon on Tuesday, the first moult took place, the newly-moulted larva was at once conspicuous by its pale yellow head, all the unmoulted larvæ had black heads, and the anterior legs were even paler than the new heads. The mandibles were jet black directly, and contrasted very strongly with the pale yellow heads.

Returning in half an hour, I found that two more had moulted, and I stayed persistently watching them for some time, in hopes I should see the actual commencement of a moult. Such things never will happen whilst you are watching for them; though I think I remained there motionless for three-quarters of an hour, no fresh moult occurred. My contemplative position appeared, however, to have attracted the attention of a robin, and he came and perched within two feet of me and eyed me very keenly.

At 1.30 p.m., I was obliged to leave my larvæ for a while, but in little more than half an hour I returned to them, but, alas! that wicked robin had ——; at any rate, the three newly moulted larvæ had all disappeared, and a few of the others.

It may not have been the robin, it may have been some other bird, but, at any rate, I would not trust any longer to the chapter of accidents, so I cut off the oak-twig and brought it and the larvæ indoors. Having placed the oak-twig in water on the table, and having about twenty larvæ yet to moult, I thought I should surely in some of them see the actual commencement of the operation—but this expectation was doomed to be disappointed.

The new pale yellow head, which usually appeared above and behind the old black head, was always visible when I first glanced at a moulting larva, however little the moulting might have otherwise advanced, but the gradual retirement of the old skin towards the tail of the larva seemed to be almost a self-acting motion, to which the larva contributed but little till the time came for extricating its anal extremity from the old skin. The anal plate, like the head, was at first of a pale yellow, but the colour of this plate, as well as of the head, got gradually darker, till eventually both were jet black, yet the black markings all along the intervening segments were black the moment the old skin withdrew from them ; in this, resembling the mandibles which, as already noted, were black on their first appearance.

The black faces of the moulted larvæ were ornamented with a central yellow mark like an inverted Y ; the faces of the unmoulted larvæ were entirely black, without any yellow mark. The anterior-legs, which were so pale on their first appearance, also became eventually perfectly black.

In one instance the yellow head of the moulted larva appeared beneath the old head, but in all the other cases the rupture of the skin must have been on the back immediately behind the old head. The old heads were completely detached from the other parts of the skin, and fell down separately from the oak-twig as the moultings progressed, so that by the prostrate heads on the table I could readily count how many larvæ had already moulted.

By Wednesday morning all but one or two of the batch had moulted, but not one had yet broken its long fast : it was not till Wednesday afternoon that feeding began. On Thursday, all the jaws were vigorously at work, and an oak-leaf was soon reduced to its mid-rib. I then turned the larvæ loose on a growing tree. From the very crowded position taken up by gregarious larvæ, moulting at times seemed to take place under difficulties, and one of the first larvæ that I observed had two other larvæ lying straight across its back at the very time that the old skin was being shuffled downwards.

I thought again and again of my first visit to Naples, where I met a German physician who had long been settled there, who assured us it was not at all unusual for the Neapolitans to sleep eight or ten in a bed.—H. T. Stainton, Mountsfield, Lewisham : *September 24th*, 1886.

Asthena luteata.—With reference to Mr. Barrett's note respecting this species (Ent. Mo. Mag., vol. xxiii, p. 109), I may state that in a small well-wooded valley near here it occurs regularly, and we always obtain it *by beating alder (Alnus glutinosa*), and in company with *Eupisteria heparata.* There is no maple *(Acer campestre*) in the vicinity, and I was always under the impression that it was a well-known fact that alder was the natural food of *A. luteata*, at least in the north of England.—J. W. Carter, Valley Street, Bradford : *October 7th*, 1886.

External parasites on Lepidopterous larvæ.—At page 115 of the October number of the Ent. Mo. Mag., in the report of the September meeting of the Entomological Society, is a notice of certain *Acari* found on a larva of *Sm. tiliæ,* and believed to be *Uropoda vegetans.*

I wish to mention two *apparent* cases of larvæ similarly infested, which have occurred to me this season. On 26th June, Mr. G. T. Porritt sent me two full-grown larvæ of *L. quercifolia*, taken at Wicken Fen; one of these I put without food in a chip-box, and on shaking it out on a piece of paper I noticed that there fell with it a bright red, *very long-legged* mite, which ran with great swiftness; I secured it, and sent it to Mr. F. Enock, but it was dried up on the journey. On September 16th, Mr. W. H. B. Fletcher sent me some larvæ of *Cilix spinula*, on one of which—a sickly one—I found a small, almost colourless, mite; this I also sent to Mr. F. Enock, but it too was spoilt for his purposes by the journey. I wish to speak of these mites with caution, but I believe they were parasitic on the larvæ.—J. HELLINS, Exeter: *October 7th*, 1886.

Erroneous record of Dichrorampha distinctana in Britain.—Mr. South has been good enough to send for my inspection a series of the *Dichrorampha* reared by him from *Chrysanthemum leucanthemum*, from the locality in which he took the specimens which I described as *distinctana*, Hein., in Ent. Mo. Mag., vol. xviii, p. 278, and I find that they are, as he says, genuine well-marked *consortana.* He also, at my request, forwarded one of the original specimens taken in 1881, and although this specimen differs in having the black longitudinal streaks very much less marked, I am now convinced that it also is simply our common *consortana.* It is, however, a brightly-marked specimen, as far as the paler and silvery markings are concerned, and bears a *very close* resemblance to German specimens of *distinctana*, but I see that there are slight distinctions, which, if constant, will always serve to separate the species. They are of almost precisely the same size and shape, except that the apex of the fore-wings in *distinctana* is rather more squared; its dorsal pale blotch is broader at the apex, and more strongly divided, each division being again divided by a black line, and the costal streaks are *single*, and developed into sinuous metallic lines, two of which compose the bright waved margins of the ocellus, and are outlined with black. If these characters are constant, they seem sufficient to enable us to discriminate the two species. The habits of *distinctana* in the larva-state are not, I think, recorded.—CHAS. G. BARRETT, King's Lynn: *October 16th*, 1886.

Choragus Sheppardi, Kirby, at Kingsgate.—While collecting with Mr. Theodore Wood in August, in a copse near this place, I found three specimens of *Choragus Sheppardi* on a dead or dying tree: the insect was not under the bark, but sitting on a portion of the trunk from which the bark had been removed; Mr. Wood subsequently took several specimens in the same place. The beetle appears to be usually found low down on the tree, and hops away quickly if disturbed; it may very probably be commoner than it is usually supposed to be, as it is a very inconspicuous insect, and from its habits may very easily be overlooked.—W. W. FOWLER, Lincoln: *October 12th*, 1886.

Aphodius lividus, Ol., near Broadstairs.—I am just now taking this insect in fair abundance from a manure-heap in this neighbourhood. The heap in question is covered with a layer of sand, and the beetle usually occurs buried an inch or two beneath the surface. I have taken most of my specimens by shaking tufts of grass, &c., growing upon the heap, after tearing them up by the roots. The beetle is not an easy one to find, as it feigns death when disturbed, and is almost undistinguishable from the *débris* among which it lies. *Xantholinus fulgidus* is plentiful in the same heap. From decaying stumps in a copse close by, I have taken six examples of the active little *Choragus Sheppardi; Staphylinus stercorarius* has been fairly common upon the shore.—THEODORE WOOD, St. Peter's, Kent: *October 2nd*, 1886.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY, *September* 16*th*, 1886: R. ADKIN, Esq., F.E.S., President, in the Chair.

Mr. Cooper exhibited a series of *Triphæna fimbria*, L., bred from North Devon pupæ; and a series of *Zygæna filipendulæ*, L., showing marked variations of the border of the posterior-wings. Mr. Adkin, *Lophopteryx cucullla*, Esp. Mr. E. Joy, a remarkable variety of *Epinephele Janira*, L. Mr. Wellman, a series of *Acidalia bisetata*, Hufn., from Folkestone; a varied series of *Bryophila muralis*, Forst., from southern localities, also *B. par*, Hb., for comparison, and also *Dianthœcia virgularis*, Hufn. Mr. W. G. Sheldon, *Agrotis agathina*, Dup.; some discussion ensued as to rearing the larvæ of this latter. Mr. J. Jenner Weir, a specimen of an *Agrotis* taken some forty years since, which has has not yet been identified. Mr. West (Greenwich), a long and variable series of *Cryptocephalus pusillus*, F., from West Wickham.

It was announced that as the Society's Rooms had proved quite inadequate on the last occasion, the usual Annual Exhibition of Specimens of Natural History would take place at the "Bridge House Hotel" on Thursday, the 25th Nov. next.—H. W. BARKER and W. A. PEARCE, *Hon. Secs.*

ENTOMOLOGICAL SOCIETY OF LONDON: *October 6th*, 1886.—ROBERT McLACHLAN, Esq., F.R.S., President, in the Chair.

Mr. W. Bartlett Calvert, of Santiago, Chili, was elected a Fellow.

Mr. McLachlan exhibited a number of seeds of a Mexican species of *Euphorbiaceæ*, popularly known as "jumping seeds," recently received from the Royal Horticultural Society. These seeds are known to be infested with the larvæ of a species of *Totricidæ*, allied to the apple *Tortrix*; they were first noticed by Prof. Westwood at a meeting of the Society held on the 7th June, 1858, and the moths bred therefrom were described by him as *Carpocapsa saltitans* (*cf.* Proc. Ent. Soc., 2nd series, vol. v, page 27). They have since been referred to both in Europe and America. A discussion ensued in which Mr. Pascoe, Mr. Poulton, Mr. Roland Trimen and others took part.

Mr. Roland Trimen exhibited and read notes on some singular objects found in the nests of *Termites*, and also in those of true ants, in South Africa. They were apparently of the same nature as those from the West Indies described in 1833 by the Rev. L. Guilding as *Margarodes formicarius*, which was usually referred to the *Coccidæ* as allied to *Porphyrophora*. They were of various shades from yellowish pearly to golden and copper colour, and were strung together by the natives like beads, and used by them as necklaces and other personal ornaments, as, according to Mr. Guilding, was the case with the West Indian species.

Mr. W. F. Kirby exhibited, on behalf of Mr. John Thorpe, of Middleton, a long series of buff and melanic varieties of *Amphidasis betularia*, and read notes on them communicated by Mr. Thorpe; also, on behalf of Mr. Nunney, who was present as a visitor, a dark variety of *Argynnis Aglaia* from Caithness, and a tawny-coloured variety of *Vanessa urticæ* from Bournemouth. Mons. Alfred Wailly exhibited a fine series of *Saturniæ* and other *Bombyces*, mostly bred by him, from South Africa; he also exhibited ova of *Saturnia tyrrhea*, pupæ of this and other South African species, and a cocoon of *Bombyx Ochadama* from Madagascar. He stated that several of the large south African *Saturnidæ* formed no cocoons, the larvæ entering the earth to undergo the change to the pupal state. Mr. Trimen said he was able to confirm the statement.

Mr. Poulton gave an account of the experiments recently made by him with the larvæ of several species of the genus *Vanessa*, for the purpose of ascertaining the relations of pupal colour to that of the surface on which the larval skin is thrown off, which had formed the subject of a paper lately read by him before the British Association, and exhibited the frame constructed by him for the purpose of these experiments. The President and Messrs. Trimen, Waterhouse, White, Hall and others took part in the discussion which ensued.

Mr. Slater exhibited a specimen of *Prionus coriarius* from Devonshire, and a specimen of *Calandra palmarum* found alive at Pembroke Dock. Mr. Enock exhibited *Mymar pulchellus*, and a specimen of *Atypus piceus* recently taken on Hampstead Heath. Mr. Elisha exhibited a series of *Gelechia hippophaëlla*, Sch., bred from larvæ collected at Deal. Mr. Billups exhibited *Echthrus lancifer*, Gr., a species of *Ichneunomidæ* new to Britain, taken at Walmer on the 15th August last, He remarked that Brischke had bred members of this genus from *Sesia spheciformis*, *S. formicæformis*, and *Leucania obsoleta;* but in this country the genus was little known, only one species *(Echthrus reluctator)* being mentioned in Marshall's list of British *Ichneumonidæ*. Mr. E. A. Butler exhibited a male and female of *Macrocoleus tanaceti* from Bramley, near Guildford; living specimens of *Chilacis typhæ*, received from the Rev. E. N. Bloomfield, of Guestling, Hastings; and a pair of *Harpalus discoideus*, obtained in August last on a heath near Chilworth, Surrey. Mr. A. J. Rose exhibited a mountain form of *Lycæna virgaurea*, recently collected by him in Norway. Mr. Champion exhibited *Teratocoris antennatus* and *Drymus pilicornis*, taken near Sheerness. Mr. W. White exhibited specimens of *Proctotrypes ater*, Nees; also a specimen of *Chelonia Caja* with abnormal antennæ, and read notes on the subject.

Mr. Elisha read a paper "On the life-history of *Geometra smaragdaria*."

Mr. C. O. Waterhouse communicated a paper "On the Tea-bugs of India and Java."

During the meeting a telegram was received from Mr. Freeman, of Plymouth, announcing the recent capture, in Cornwall, of *Anosia Plexippus*.—H. Goss, *Secretary*.

OCCURRENCE OF *BOTYS REPANDALIS*, SCHIFF., IN BRITAIN.

BY C. G. BARRETT, F.E.S.

The Rev. Henry Burney has forwarded to me for examination specimens of a pretty little yellow *Pyralis* reared by him some years ago, but which he had set aside under the impression that they belonged to a common species. I find they are certainly *Botys repandalis*, Schiff., agreeing accurately with specimens sent me by the late Prof. Zeller. Mr. Burney tells me that he found the larvæ in June feeding in the heads and young shoots of *Verbascum nigrum* on the south coast of Devon. They were yellowish-white with black spots, and fed on the young leaves, eating down into the shoots, but left the plant when full-grown, and assumed the pupa state among the *débris* at the bottom of the breeding cage, the moths emerging in the following month. This pretty species has not, I believe, hitherto been recorded in this country, but is not uncommon in central and southern Europe. It is very closely allied to *hyalinalis* and *pandalis*, but of a paler yellow, and decidedly smaller than either, being of about the size of *verbascalis*, but with narrower fore-wings. The fore-wings are of a delicate pale straw-colour, and the markings, which closely resemble those of *hyalinalis*, are of a faint yellowish-grey. The first line is comparatively straight, the second also straight from the middle of the dorsal margin to the middle of the wing, where it *touches* the discal streak or stigma, then turns abruptly towards the hind margin and makes a wide sweep before turning again towards the costa; the third is parallel with the hind margin. These three lines are continued upon the silky whitish hind-wings.

Dr. E. Hofmann describes the larva:—

> "Thick, tapering anteriorly, yellow-white, with many single hair-bearing raised dots. Head honey-yellow, dorsal plate of the colour of the body, studded with warts. From March until May, and in July, in the leaves of *Verbascum* in a felted mixture of fragments of the plant. Assuming the pupa state in a red-brown cocoon. Imago in June and August; widely distributed."

Treitschke says (under the name of *pallidella*):

> "The larvæ live gregariously from March to May, and the next brood in July, among the leaves of *Verbascum thapsus* and *thapsoides*, in a mixture of silk and the down of the plant, or in the flower shoots in a little passage eaten down into the stem. They are yellow, with black dots. Pupa yellow."

This species is a welcome and extremely interesting addition to the British fauna.

King's Lynn, Norfolk:
November 13*th*, 1886.

NOTES ON SOME SPRING-FREQUENTING *TRICHOPTERA*.

BY KENNETH J. MORTON.

In one of our glens there is a corner which is well known to some of my Neuropterological friends as one of the few British localities where *Drepanopteryx phalænoides* has been found, and as the only known one for *Adicella filicornis*. To those who do not know it, let me explain that this corner lies in a deep gorge with steep, well-wooded sides, and that its situation is perfect as far as protection from cold winds is concerned. From the sides of the glen here, many trickling springs arise, and the water from them, after streaming over moss-grown rock-faces at some points, finds its way into the river by various channels which run through a patch covered with a luxuriant vegetation. Quite a number of the spring-frequenting *Trichoptera* haunt this spot, and during the summer *Crunœcia irrorata*, *Beræa pullata*, *Adicella filicornis*, and *Diplectrona felix* may all be found together. Having paid some attention to these little caddis-flies I propose to give some account of the habits and cases of the three first-named, which I have reared.

CRUNŒCIA IRRORATA, Curt.

On the wet rock-walls, amongst the moss which in some places covers them, and in the small channels which draw off the water to the river, may be found cases from 6 to 8 mm. in length, made of small square plates, cut out of fresh or dead leaves or moss, sometimes mixed with fibres placed transversely. The plates and fibres are neatly cemented together, so as to form perfectly quadrangular cases. As already recorded (vol. xxii, p. 43), these cases are the work of the larvæ of *C. irrorata*.

But the cases of *C. irrorata* are not always quadrangular: very junior larvæ inhabit cases which are almost perfect cones made of sand grains, rather rough externally; and examples may often be found in a transition state—mouth-end quadrate, made of vegetable matter; tail-end consisting of the sand-cone with the apex cut off. There is before me one taken from a rock-spring the other day, and of a length of 8 mm.: 5½ mm. is composed of vegetable matter, arranged in the usual way, while the rest is made of sand. In another the proportions are just about reversed. So, while the gradual change appears to be usual, it is possible that under certain conditions the sand-case is persistent, simply increasing in size, and becoming less attenuated towards the tail-end—a conjecture which applies equally to *L. hirtum*, another quadrangular-case maker, but not to *B. subnubilus.* The case of *B. subnubilus* is one of the most remarkable we have, and it differs much in texture from those of the other two species.

The larva of *C. irrorata* is white, with a greenish or yellowish tint. Head, a rounded-oval, with some isolated hairs, uniform dark brown. Pronotum transverse, as wide as head, short, anterior edge straight, posterior rounded; a few isolated hairs on the disc, and a fringe of long stiff hairs on the anterior margin, which hairs are directed forwards, and slightly upwards; dark brown. Mesonotum transverse, broader than pronotum, and paler in colour, especially on its posterior part; a few scattered hairs; side-pieces, to which legs are attached, darkly marked. Metathorax short, transverse, broader than preceding segments; a few hairs arising from warts; side-pieces as in mesothorax. The legs are yellowish, with long hairs; first pair short; other two pairs rather long and subequal. The abdomen is nearly parallel on the sides; along the lateral lines runs a fringe of very fine hairs; respiratory filaments isolated, and not very numerous, of moderate length; the last segment is narrower than the rest, and the crochets are brown, and bear some long and very strong black hairs. There are lateral processes on the first abdominal segment, but I cannot make out their true form; when protruded they show a delicate fringe.

It is now known that quadrangular cases of three kinds exist in Britain, belonging, as indicated above, to *Brachycentrus subnubilus*, *Lepidostoma hirtum*, and the subject of the present notice. Later I hope to say something about *L. hirtum*; the history of *B. subnubilus* has been written so well already that it hardly requires supplement (McLach., Ent. Mo. Mag., vol. x, p. 257).

Hagen appears to have been the first to notice this form of caddis-case, and in the Stett. ent. Zeit., 1864, p. 113, he refers to what he considers three kinds. Probably his No. 2 belongs to *B. subnubilus*, and No. 3 to *L. hirtum*, or an ally. No. 1 is altogether remarkable. It was received from Bremi, who states that he found it amongst moss far from water, and, certainly, the size given, and other points in the description, suggest *Crunœcia.* The larvæ of this insect are not so absolutely aquatic in habit as those of many species; they can, no doubt, stand total submersion in shallow water, but they crawl about quite freely as long as there is moisture present at all, and in captivity spin up on damp stones, or on the sides of glasses just touching the water. *Enoicyla* is the only known Trichopterous genus presenting truly terrestrial habits during larval life, and Bremi's declaration is not yet to be explained, unless it is assumed that some unseen driblet existed, which gave the essential, if little, moisture.*

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* Compare de Rougemont (Bull. Soc. Sci. Nat. Neuchâtel, xi, 405—426) and McLachlan (Mon. Rev. Europ. Trich., 1st add. suppl., p. 30), on *Helicopsyche.* *Adicella filicornis* in its early stages appears to prefer simple humidity to total submersion; so, too, probably, do all species frequenting such places as *C. irrorata* affects. A small larva, which I take to be that of a *Wormaldia*, but which I have not yet been able to rear, succumbs very soon if placed in water of any depth.

In the Stett. ent. Zeit., 1867, p. 59, McLachlan describes cases made out of fragments of fern roots, which are no doubt those of *C. irrorata*. As a matter of fact, he bred that insect from the moss containing them; but since there were two other forms of case present it was not possible to say conclusively from which it emerged.

It is uncertain whether Pictet's figures of the larva and case of his *Sericostoma hirtum* (Recherches, pl. xiv, fig. 3) refer to *C. irrorata.* The case is represented as a sand-grain one, but that would not be an objection if, as I suspect, such cases, normally peculiar to young larvæ, are sometimes permanent.

It would be interesting to know if any other genus of the *Sericostomatidæ* (or, less probably, of any other family) has cases of the quadrangular type. The only other British species which might have been suspected is *Lasiocephala basalis*, but Meyer says it makes a sand one. *Oligoplectrum* has also a slender case of sand. *Micrasema* remains; the habits, which are quite unknown, might easily receive elucidation at the hands of the continental entomologists.

BERÆA PULLATA, Curt.

The habits of the genus *Beræa*, as regards the perfect insects, are well known. These small black caddis-flies are to be found usually in abundance about shallow streams where reeds, *Caltha palustris*, and other water-weeds grow in such profusion that often in summer no water is to be seen at all. In such places the larvæ of *B. pullata* are to be found, and they also occur in the channels alluded to at the beginning of these notes.

The rank character of the vegetation, and the great quantity of vegetable *débris* which usually covers the beds of the streams *Beræa* delights in, render the search for the small cases very difficult. The best way to obtain them is to take from the bottom hauls of mud, &c., which are put into a bag, and, after washing away the loose sand in some convenient burn, by examining what remains one or two may be found. This operation can be conducted best in the early spring, when there is less vegetation to contend with.

There is only one full-sized case before me; it is about 10 mm. long, composed of sand-grains, is strongly curved, and tapers greatly to the tail end; the mouth-end is closed by the usual button-like operculum, in which there is an excentric slit. The colour is blackish. This case, from which the perfect insect was reared, was buried for about two-thirds of its length in sand; but no doubt the larvæ usually spin up about the roots of water plants, as in *Beræodes*. After most exhausting efforts, this larva got hoisted to the top of an enormous stone (in proportion to the creature's size), which was fixed not so as to close the case, but at the side evidently to serve as a *point d'appui* when the operculum came to be forced by the nymph. The fixing of the case took place on May 20th, and the perfect insect appeared June 7th.

The larva is of a distinctly Leptoceridous type, from the great development of the posterior legs. The head is almost round; the prothorax transverse, with the sides produced anteriorly into a tooth: these two segments are of a bright reddish colour, while the rest of the body is white, or, in older examples, yellowish. The body is rather slender, and tapers gradually to the anal extremity; a slight fringe on the penultimate segment; crochets with bunches of hairs, and above them small protuberances, bearing one or two bristles of great length, and a few shorter hairs; no external respiratory filaments. The legs are rather thickly clothed with long silky hairs.

ADICELLA FILICORNIS, Pict.

The habits of this pretty little species were known to Pictet, and he has described and figured the larva and case in "Recherches" (p. 171, pl. xii, fig. 6).

I made the acquaintance of the perfect insect in June, 1884, and and on April 8th of the present year found the cases in small cavities, where there was a constant trickle of water, and which were covered with a facing of moss. The moss was, of course, moist, and on its inner face the cases were fixed. They mostly contained nymphs. Only two were found containing larvæ, and I am not sure now whether they came from the mossy roof, or from the floor over which the water streamed; they soon spun up, and the first insect came out on May 16th.

The cases are 8 to 10 mm. in length, strongly curved and tapering, composed of sand-grains on an inner tube of silk. They are usually of a russet colour, but some are blackish in the older parts, as is usual in cases of this form. They seem to be covered with a deposit of some kind, which gives them a comparatively smooth appearance.

The shape of the case of *B. pullata*, the long legs and reddish head of its larva, led me to suspect at first that Pictet had erred in his identification of the larva of his *Mystacides filicornis*. There is a superficial resemblance between the two in the points mentioned, but the more elongate head and uncoloured prothorax of the larva of *A. filicornis* are good differential characters, not to speak of its antennæ, which are developed to such a degree that they are distinctly indicated in Pictet's figure, though he makes no reference to them in the text.

This insect's long antennæ are curiously disposed of while the nymph is still enclosed in the case. They are neatly wound in a double spiral round the posterior part of the abdomen. Possibly all the long-horned *Leptoceridæ* have theirs rolled up in the like manner.

It appears to me that *Diplectrona felix* also breeds within my limits, but its larva has hitherto escaped detection. Those caseless larvæ are more difficult to find, and more difficult to rear than case-bearing ones.

It is not to be thought that these four species exhaust the list of spring-frequenting *Trichoptera* of even this neighbourhood. I believe, however, they represent the complete Trichopterous fauna of the spring I have had especially in view when writing these notes.

Carluke, N.B.:
October, 1886.

NOTE ON SOME BRITISH *COCCIDÆ* (No. 5).

BY J. W. DOUGLAS, F.E.S.

Aspidiotus zonatus.

Aspidiotus zonatus, Frauenf., Verhandl. z.-b. Gesells. Wien, 1868, p. 888. Sign., Ess. Cochin., p. 109.

Aspidiotus quercus, Sign., Ess. Cochin., p. 106.

♂. Scale flat, long-oval, sides somewhat parallel, ends broadly rounded, dingy whitish, the exuviæ darker or yellowish, oval, slightly raised, situated towards one end, usually not reaching the sides, of which the margin is in the least degree recurved. The length varies from 1·45 down to 1·075 mm.

♀. Scale whitish, rounded, diam. ·50 mm. or less, the insect without abdominal agglomerated spinnerets, according to Signoret.

♂ imago lemon-yellow, wings white.

On the 27th September last, near here, I found common, close to the ribs on the under-side of the young terminal leaves of short, lateral shoots of a stunted, weather-beaten oak (*Quercus robur*), growing in a very exposed situation, the scales of an *Aspidiotus*; and on referring to Signoret's translated description of Frauenfeld's *A. zonatus* (*l. c.*), an oak feeder, it was seen that these agreed therewith, except as to the length and colour, the former being given as "d'un huitième de millimètre," and the latter as "blanchâtre, avec une zone entourant la côte." Turning then to Frauenfeld's original description (*l. c.*), which is illustrated by a figure, I saw that the length is given as 1·8 mm. ($\frac{1}{8}$ mm. being evidently an error of the translator), and this, though in excess of that of my example, is much more approximate; still the discrepancy as to the colour remained.

The description of the ♂ scale of *Aspidiotus quercus*, Sign. (*l. c.*), found on oaks, accords with my examples, but the dimension is not given; it is only said "Cette espèce nous parait distincte de *zonatus*, Frauenfeld."

To elucidate the matter, I sent some leaves with ♂ scales attached to Dr. Signoret, and he, with his usual courtesy, at once replied: "Les échantillons sur chêne sont l'*Aspidiotus zonatus*, Frauenf., = *Asp. quercus*, Sign. Je n'avais pu reconnaitre d'abord cette espèce à cause des différences de couleurs, mais l'ayant reçue de Vienne je n'ai plus aucun doute à cet égard." I may surmise that, as in other species of *Aspidiotus*, the colour changes with the age of the scale; the length evidently varies.

The scales I examined were empty, no doubt due to the previous exit of the ♂, the time for its appearance, as stated by Frauenfeld, being the end of August or beginning of September; but Mr. G. S. Saunders, to whom I sent some scales, was fortunate enough to obtain two males, one of which was alive.

In comparison with the number of ♂ scales, of which there were sometimes as many as 30 on one leaf, those of the ♀ were scarce. They are small and rounded, but I suspect would grow much after the fecundation of the ♀, and that the eggs would not hatch until next year, so that there may possibly be a summer brood. Signoret found ♂ scales on the trunk as well as on the leaves; this I failed to do, but without there are ♀ scales and eggs also deposited on the branches it is difficult to comprehend how the race is carried on, as the leaves are all fallen by the end of October and perish during the winter. The ♂ scale is remarkable for its form and great size, as well as for its being larger than that of the ♀, the converse of the latter being the rule. In the spring of 1885 Mr. Saunders found on oak leaves of the previous year, at Frant Wood, a few scales, which were probably of this species, but being shrunk and empty, nothing could be made of them. Frauenfeld first discovered the scales of his *A. zonatus* (but only the ♂) extremely abundant on the leaves of *Quercus montana*, Willd., an American oak growing in the Botanic Garden at Vienna, and it is therefore curious that this *Aspidiotus* is not enumerated by Comstock among the American species known to him. It is new to the British list.

ASPIDIOTUS NERII, Bouché.

Scales flat, white or yellowish-white; ♀ when adult 2 mm. in diameter, circular, when immature with a more irregular outline; the larval exuviæ nearly central, yellowish: ♂ smaller, elongate, oval. ♂ imago yellow, mottled with orange-brown, I have not seen.

In February Mr. G. S. Saunders found ♀ scales on *Aucuba* and a *Dracæna* under glass at Canterbury, and in July I found both sexes abundant, but mostly immature, on the under-side of the young leaves of a greenhouse *Azalea*: all these on examination exhibit the spinnerets and abdominal appendages of *A. nerii*, as described and figured by Signoret and Comstock. This species, which is in Walker's British List, is the commonest of the genus, and lives not only on the oleander but a great variety of plants, and in the south of Europe and the United States of America flourishes in the open air.

MYTILASPIS ULICIS, Doug.

Under this name I previously recorded provisionally (vol. xxii, p. 249) a *Mytilaspis* living on the spines of furze, and in addition to what was then stated as to the habitat, form and position of the scales, I have now to state that they are shining and not dull brown, and do not become black by age as in *M. pomorum*; that the margin is distinctly dentate at intervals; and the ventral pellicle regularly pitted all over with small circular depressions remains entire, and is not separated up the middle. The spinnerets and abdominal fringe, as in some other species of the genus, are very like those of *M. pomorum*, yet with a difference, not difficult to see, but not otherwise to be apprehended. Taking into consideration all the circumstances pertaining to this form, I certainly believe it to be a distinct species that can easily be recognised by any captor.

PSEUDOCOCCUS FAGI, Baerensp.

At the end of May last, at Blackheath, I saw on the trunk of a beech tree, some 40 or 50 years old, many white spots of flocculent matter protruding through small cracks in the dry, black bark, forming mostly isolated, short, stout tufts or streaks, but sometimes several of them were close together, making conspicuous patches. I cut out some of the bark so affected, and found that the flocky matter extended under the free edges of the cracks as it were into the dead or dry bark, and there were in each instance from four to eight fat, yellow, oval Coccids lying close together, but each separately in a kind of cell formed in the compact felt-like cottony flocks.

On the 16th July I again visited the tree and cut out several of the white patches, and found in each 8—12 pale yellow Coccids closely packed together in the felt-like cotton, and surrounded with eggs. Under the microscope I saw the Coccids were just mature.

They were of sulphur-yellow colour; in form a short rounded-oval, barely half a line long, nearly circular, very convex both above and below, and therefore almost globose, clothed above with the finest possible pubescence, but without any projections at the sides or end, except some pale setaceous hairs on the latter. Viewed from beneath, on the anterior margin of the head were two blackish angulated eyes, rounded in front, extending obliquely inward and downward to a long, fine point: a short, appressed, covered rostrum, of which the brown tubular end was free and turned at a right angle, and from this end projected an extremely fine blackish seta, three times the length of the body, which waved about like a grass stem in the wind. Antennæ short, thick, apparently of three joints only. Legs short, but being embedded in the fat body, and like the antennæ concolorous, difficult to see. All the segments of the body determinable, the junction along the sides of the upper and lower half-rings of the abdomen forms a continuous thickening there. I saw in several instances the actual extrusion of eggs, large, pale yellow, oval, transparent, filled, apparently, with fluid, in which, in a day or two, faint granulation appeared; seven or eight of the eggs seem to have been laid by one mother; their size was very large in comparison with the maternal body, but this shrivelled after their exclusion. I saw no trace of a male, and that sex appears to be unknown.

In August Mr. Parfitt found some of these Coccids on beech trees at Exeter.

Turning to Signoret's "Essai sur les Cochinelles," I find that the author knew only by description a *Coccus fagi*, which he attributes to Hardy, and first cites as a *Pulvinaria*? (p. 212); then (at p. 453) he says it is wrongly placed thus, and gives it as *Coccus fagi*, Walker (List of Homopterous Insects in the Collection of the British Museum, part iv, p. 1086, 1852), saying, "Voici la description insignifiante qu'en donne l'auteur: "*Flava, elliptica, albo farinosa*; length, 2 lines." Cette description convient à tous les *Dactylopius*, *Pseudococcus* et *Coccus*:'" Signoret also adds, "We think this species may only be that of Baerensprung, and should probably be placed in our series of *Pseudococcus*."

Having referred to Mr. Hardy for any information he could give respecting this species, he very kindly sent the following communication, dated June 14th, 1886:

"You have assuredly found *Coccus fagi*. I first gave an account of it, from Dalkeith Park, in the 'North British Agriculturist and Journal of Horticulture,' 1849 or 1850. I did not describe it, but mentioned it as *Coccus fagi* of Walker, who told me he had found it in some of the London Parks. The last notice I gave was in the 'Berwickshire Naturalists' Club Proceedings,' vol. x, pp. 607—8; I transcribe it:—

"'*Coccus fagi* in the Ravensworth Woods. When walking in the end of August, 1884, with the Rev. R. H. Williamson, in the woods near Wheckham Washing-well Dean, belonging to the Earl of Ravensworth, I observed that several of the trunks of some old beeches were spotted white with the cottony investment of *Coccus fagi*, which is not recorded in any of the lists of the insects of Northumberland and Durham. It was a place I knew, for I had been there entomologizing more than thirty years previously. On November 5th, 1883, I noticed that it still exists in Dalkeith Park, and as I have noticed before (vol. x, p. 263) it occurs in

Gosford Park (Earl of Wemys, East Lothian), and near Ayton (Berwickshire); still more recently I observed it on beech trunks and roots at Polton Bank (near Hawthornden, Midlothian), on both sides of the road to the railway station.' "

Following up Signoret's indication of Baerensprung's *Coccus fagi*, I find it described in D'Alton and Burmeister's "Zeitung für Zoologie, Zootomie und Palæozoologie" (1849), vol. i, p. 174, thus:—

"*C. fagi.* ♀. *Lutea, ovata, abdominis apice hirsuta, capite minuto, antennis brevibus crassis.* *Long.*, ¾ *lin.*

"On the beeches in the Berlin Thiergarten. The females, as in the foregoing species (*C. strobi*), are enveloped in a thick felt, which appears to proceed especially from the hinder part of the thick and soft sulphur-yellow insects. The antennæ are very short and thick, and near them the black eye-points (Augenpunkte). The short legs are almost entirely retracted into the plump body.

"In December I found on the same then leafless bushes the white felt packs, in which the females were no longer to be seen, but numerous eggs and larvæ instead. The latter had all the same elliptic form, two red eye-points, and short, five-jointed antennæ, which had some setaceous hairs at the extremity. The last segment of the abdomen was furnished with two pairs of papillæ, the inner smaller than the outer, and some setaceous hairs between them.

"Among the larvæ was a strongly-haired, sulphur-yellow Acarid."

I think it is clear from the foregoing that my insect is the *Coccus fagi* of Baerensprung, the only real difference in the descriptions being in the length of the body, which, as given by Baerensprung, is somewhat in excess of that I find. It is also sure that it is the same as that recorded by Hardy, and which Walker described under the name of *Coccus fagi*, Walk., doubtless unaware of Baerensprung's previous description under the same name: the length, "2 lines," is a palpable error.

The genus *Pseudococcus*, Sign, is not exactly the same as the original *Pseudococcus*, Westwood, founded on *Coccus adonidum*, *C. cacti*, &c.; but not to argue nor to put too fine a point on the matter, the genus, in either case, may be regarded as, like Mercutio's wound, not of strictly definite dimensions, and like it also—" 'tis enough, 'twill serve" —for this occasion.

Dactylopius destructor.

Dactylopius destructor, Comstock, Report for 1880 (1881), p. 342, pl. xi, fig. 3, ♀, pl. xxii, fig. 2, ♂.

♀. Adult oval, 3—4 mm. long, 2 mm. wide. Dull brownish-yellow, legs and antennæ concolorous. Surface of body, and the under-side also, but thinly covered with fine, white, granular, waxen secretion, so that the ground-colour shows through it faintly, the result being often a livid appearance. The marginal projecting appendages (17 on each side), white, short, in length sub-equal, except that in some examples two of the posterior ones are a mere trifle longer. Antennæ 8-jointed, 8th joint longest, 4th shortest; tarsi about half the length of the tibiæ. Eggs yellow, laid in a cottony mass, which eventually covers the ♀. Young larvæ yellow.

♂ rather less than 1 mm. in length, expanse of wings, 2·5 mm. Body slender, light olive-brown, legs concolorous. Wings grey-white; halteres small, slender, bent, hook-form. Antennæ reddish-yellow, 10-jointed, 3rd and 10th joints longest, subequal. Eyes and ocelli dark red. The two anal filaments long, white.

The ♀ of this species is at once distinguished by the shortness of the projecting filaments on the circumference, and the non-elongation of two posterior ones, as in other species.

On May 18th, in Mr. Stainton's forcing-pit, cucumber plants were infested with a *Dactylopius* to that extent that the leaves were in a state of collapse, each leaf having on its under-side a colony in all stages of life. Among the cottony web, which was plentiful, I found also, alongside the ribs of the leaf, some living males, which, however, were not active. On July 24th females of the same species abounded on cucumber plants in a frame on a hotbed, but there were no males. Of these females I took several, and having subjected them for a long time to the influence of the vapour of benzine, I deemed they were dead, and gummed them on to card, but the next day I was surprised to see that from each had been expelled a long string of cylindrical, yellow eggs, joined together at their truncate ends; looking again after some days I found that the eggs had disappeared, and that the larvæ that had emerged had spread all over the small box that had contained the females, carrying with them a cottony web, and that the mothers had shrunk into shapeless masses.

In his "Essai sur les Cochinelles," Signoret enumerates 18 species of the genus *Dactylopius*, of which a prominent character is that the body of the ♀ has a series of projecting filamental appendages on the circumference, variation in these and other structural characters, of more or less importance, being found to differentiate the respective species; yet it is a striking feature of the descriptions that each species is said generally to resemble one or another of them. There can, however, be no doubt as to the distinctness of that now in hand (which was not known to Signoret), by reason especially of the peculiar shortness and equality in length of the circumferential appendages, and also, I think, that as it fits so well the description, there is no question it is *destructor*, Comst. It is said to be very abundant upon almost every variety of plant in the department greenhouses (at Ithaca). The name *destructor* is, however, proposed for this insect from the damage done by it to orange trees in Florida, especially at Jacksonville and Micanopy, where it is the most serious insect-pest of the orange (*op. cit.*, p. 343). It is an addition to the British List.

8, Beaufort Gardens, Lewisham:
Oct. 10*th*, 1886.

LIST OF BRITISH *TIPULIDÆ*, &c. ("DADDY-LONGLEGS"), WITH NOTES.

BY G. H. VERRALL, F.E.S.

(*Continued from page* 125).

DICRANOMYIA.

1 (4) Origin of radial vein considerably before end of mediastinal vein.

2 (3) Discal cell open, coalescing with second posterior cell, outer half of disc of wing nearly glabrous ....*aquosa, n. sp.*

3 (2) Discal cell closed (if = *D. pubipennis*, O.-S., and consequently discal cell sometimes open, it coalesces with third posterior cell), outer half of disc of wing pubescent ....*pilipennis,* Egg.

4 (1) Origin of radial vein nearly opposite end of mediastinal vein.

5 (6) Subcostal cross vein practically at the end of the mediastinal vein (frons silvery, wings spotted) ....*dumetorum,* Mg.

6 (5) Subcostal cross vein far before the end of the mediastinal vein.

7 (20) Wings either clear, or with a stigma only, or *(D. chorea)* with a dark stigma and the cross veins somewhat clouded.

8 (19) Thorax not shining black ; frons and pleuræ dull.

9 (10) Joints of the outer half or more of the antennæ elongate, and bearing bristles three times as long as each joint (basal joint and rostrum yellow) ....*modesta,* Mg.

10 (9) Joints of the antennæ not elongate ; the bristles thereon only about as long as each joint.

11 (14) Distinctly ochreous species, even though there may be dark lines on the thorax (see also *D. chorea*), cross veins never infuscated, stigma faint or absent.

12 (13) Antennæ all blackish ....*mitis,* Mg.

13 (12) Antennæ yellowish at base ....*lutea,* Mg.

14 (11) Species not at all, or very little (*D. chorea*) ochreous.

15 (18) Stigma distinct.

16 (17) Pleuræ somewhat ochreous, cross veins usually somewhat infuscated .. *chorea,* F.

17 (16) Pleuræ not ochreous, cross veins not at all infuscated ...*stigmatica,* Mg.

18 (15) Stigma absent ....*sericata,* Mg.

19 (8) Thorax shining black, frons and pleuræ silvery........... ....*morio,* F.

20 (7) Wings conspicuously spotted, at any rate three distinct spots near costa.

21 (22) Wings with only the three spots near costa conspicuous, mediastinal vein ending nearly opposite one-third the length of the præfurca... *didyma,* Mg.

22 (21) Wings dotted along the postical vein, besides numerous other spots ; mediastinal vein extended slightly beyond the origin of the præfurca... *ornata,* Mg.

D. AQUOSA, *n. sp.* (♂ ♀).—*Minor, nigro-brunnea subnitida ; alis glabris immaculatis præter stigma infuscatum ; venâ mediastinali pone præfurcæ initium extensâ, cellulâ discoidali apertâ.*

Distinct from all European species by its open discal cell, and (except from *D. pilipennis*) from all British species by the origin of the præfurca being considerably before the end of the mediastinal. The smallest British species, being slightly smaller than *D. morio*; brownish-black, somewhat shining, a pale line between dorsum and pleuræ, the whole disc of the abdomen with a lurid yellowish tint.

♂. Antennæ all black, basal joint shortish, joints of the flagellum oval, bearing bristles nearly three times as long as each joint; palpi black; rostrum shining blackish; frons and vertex blackish-brown, with grey reflections of tomentum. Halteres brownish-black, yellow at base. Pleuræ with yellowish reflections and greyish tomentum. Genitalia dark yellowish-brown at the base, becoming nearly black at the end, the basal lamellæ simple externally, inside at end above is the usual hooked process on each, on which are two long diverging bristles, yellowish-brown at their base; outer lamellæ smallish, ending above in a strong curved spine; middle piece long, dark yellowish; sometimes it appears as if the end of the basal lamella, or the base of the outer lamella, had (when seen sideways) two curved spines above, and the outer lamella a long almost straight one below, hence it is evident that the hook at the end of the outer lamella originates near the base of the lamella and can be unfolded. Legs blackish, lurid at base, end of femora (especially front pair) rather thickened; coxæ and trochanters yellow. Wings smoky, extreme base yellow, stigma distinct, almost blackish to the naked eye; veins on the outer half of the wing pubescent, bearing rather long hairs. The mediastinal vein and its subcostal cross vein end in what looks like a short fork rather beyond the middle of the præfurca, the dark stigma is elongate-oval, at its end are the end of the subcostal vein and its marginal cross vein, both very faint, the cross vein is considerably the longer and bent downwards, making the end of the subcostal appear like a short cross vein to the costa; the marginal cross vein joins the upper branch of the radial at about one-third the length of the latter; the præfurca is more than half the length of the forks of the radial; all the veins near the tip of the wing curve down; the discal cell is always open and coalesces with the second posterior cell, making the discal vein forked; the bases of all the posterior cells are nearly level, the submarginal being only a little nearer the base of the wing; anal vein a little incurved at its end.

♀. Very similar to ♂, but the base of the legs a little paler; ovipositor reddish-yellow.

This species is evidently closely allied to *D. pilipennis*, Egger (= *L. turpis*, Wlk.), but is easily distinguished by its smaller size, open discal cell, and by the disc of the wing on its outer half not being pilose; it appears a little like *D. morio*, but is really very distinct; I find a *L. aperta*, Lw., next to *L. morio* in Verh. z.-b. Wien, xxiii, 27 (1873), but I cannot trace any description.

Common near the Falls of the Shin in Sutherlandshire, from July 11th to 17th this year, near the water on the damp sides of cliffs, and more sparingly at other similar places, also on the Ross-shire side of the Oykel.

D. pilipennis: Egger's description was published in Verh. z.-b.

Wien, xiii, 1108 (1863), and Walker's *L. turpis* in Ins. Br. Dipt., iii, 300 (1856), but Walker described another *L. turpis* in Ins. Saund., 434 (1856); which of Walker's species has priority I do not know, the preface in Ins. Br. Dipt. being dated February, 1856, while that of Ins. Saund. is January 18th, 1856; under the doubt and carelessness I think both Walker's names had better cease. Prior to Egger's again is Osten-Sacken's description of *D. pubipennis*, Pr. Ac. Nat. Sc. Phil., 211 (1859), which I expect will prove to be the same species, but I dare not adopt the name of an American species without close comparison with European specimens; after all I think Meigen's *L. fusca*, Sys. Bes., I, 133, t. 4, f. 19 (1818), will prove to be this species, and then there can be no doubt as to priority of nomenclature; in the mean time Egger's name "holds the field." The species seems to be not very uncommon in the south of England, as I have taken it in Kent, Sussex, Hampshire and Devonshire during the last two years.

D. modesta, Mg.: this species may be known at once by its verticillate antennæ with elongate joints; I have not the least doubt that I have the species intended by Meigen (Sys. Bes., I, 134), and Zetterstedt (Dipt. Skan., x, 3863, where the antennæ are described in detail), but I am very doubtful about Schiner and others, by whom the species of *Dicranomyia* have been very insufficiently studied, and it is certainly not the species so called by Osten-Sacken (Stet. Ent. Zeit., xv, 211). They all require very close study of the male genitalia, and by help of these characters I believe at least two more British species will be distinguished, only the material at my disposal is unsatisfactory; however, apart from the genitalia, the antennæ will always distinguish *D. modesta* from any other species I am acquainted with. I catch it abundantly in August and September near Mildenhall and Exning in Suffolk, also in June in the New Forest, and late in August in extreme South Devon (Slapton).

D. chorea, Mg.: this is the commonest species of all the *Tipulidæ* and *Limnobiadæ*, occurring in every garden or wood throughout Great Britain, and yet it is still to me a most unsatisfactory species; in its commonest and most typical form it has a distinct reniform stigma and infuscated cross veins, in which state it is easy to distinguish, but its markings fade off so much that specimens without the infuscated cross vein are very puzzling. I hope, by further examination of the male genitalia in a living state, to come to more definite conclusions. The allied species in Britain are what I call *D. stigmatica*, *lutea*, *mitis*, and one or two more; *stigmatica* I am not at all satisfied with; by it

I mean a slightly larger darker species than *chorea*, but with the wing markings consisting of a distinct stigma only; I have numerous females, but only one unsatisfactory male. I believe the *D. stigmatica* of the continent is a good distinct species, and I have no doubt it occurs here; my so-called specimens extend from the New Forest to Tongue, but are most abundant northwards. My *D. lutea* may always be known from *D. mitis* by the yellowish base of the antennæ, and the basal lamella of the male genitalia has a process beneath which is not present in *D. chorea*, it is common in Sussex and Hampshire; very close to this, only with very different genitalia, comes another yellowish species of which I possess no good specimens; then comes what I may consider *D. mitis*, Mg. (rather than give it a new name), it has the antennæ all blackish-brown, and the basal lamella of the genitalia with a long process beneath; it was common in the New Forest and at Lymington in June, 1885, but I have not met with it this year.

Under this group of species come Walker's *L. albifrons*, *globata*, *sera*, *inusta*, *disjuncta*, *stigma*, and *excisa;* I hope at some future date to dispose of these with greater certainty, when I thoroughly understand those in my own collection.

D. sericata, Mg., is a perfectly distinct and not uncommon species; it is much darker than the others, and has almost blackish legs, while the wings are entirely without even a stigma; Walker described it as a new species, which he called *L. glabrata* (Ins. Brit. Dipt., iii, 299), that name was, however, pre-occupied by Meigen (1818), and I see no reason to doubt its being Meigen's *L. sericata.* I have taken it in Sussex, Kent, in my own house, and once in abundance in a grass field near here; I think it is a May species only just extending into June.

D. dumetorum, Mg.: Walker has mixed up *D. dumetorum* and *didyma* in his descriptions in Ins. Brit. Dipt., iii, 296 & 297, because *D. dumetorum* is the species with two spots on the costa, and *D. didyma* the one with three spots, in other respects he is right, and all specimens named by him which I have seen were correct. I have seen the type of *L. transversalis*, Wlk., which is certainly *D. dumetorum*; while all the specimens I have ever seen called *L. oscillans*, Hal., were certainly *D. didyma*, and Haliday's description (Ent. Mag., i, 154), perfectly agrees with *D. didyma.* The habits of the two species are very distinct, *D. didyma* occurring almost everywhere that water runs down an almost perpendicular surface, such as sluice gates or overflow from water mills, sides of waterfalls, and similar localities; while *D. dumetorum* frequents bushes in comparatively dry places: both have a wide range in Britain, as I have taken *D. dumetorum* from the Isle of Wight to Sutherland, and *D. didyma* from Devonshire to Sutherland.

(*To be continued*).

Salpingus mutilatus, Beck, a British insect.—Three examples of a *Salpingus* captured by myself on different occasions by evening sweeping in open beech woods on the chalk downs at Caterham, in September, 1872, and September, 1874, and a fourth taken in a similar manner at Gomshall, Surrey, in August, 1873, are referable to this species.

S. mutilatus, Beck (= *S. virescens*, Muls., 1856, *nec virescens*, Lec., 1850), has not hitherto been recorded from this country. Mulsant (*cf.* Rostrifères, p. 41) separated the species from true *Salpingus*, on account of the somewhat different structure of the rostrum, and placed it by itself in his section *Colposis*. In the general structure of the head and oral organs it is almost intermediate between the true *Salpingi* and *Rabocerus*, Muls.; the latter contains only one European species, *R. foveolatus*, Ljungh, and is not regarded by recent writers as generically distinct from *Salpingus*. The present insect will be readily known from our true British *Salpingus*, *S. ater*, *S. æratus*, and *S. castaneus*, by the long exserted mandibles, the broadly flattened and almost concave frontal region of the head, the shorter thorax, the strongly impressed elytra, the very shining upper surface, the greenish-bronze colour, the reddish-testaceous labrum, mandibles and legs, &c.; from *S. foveolatus*, which it more nearly resembles in the structure of the mandibles, by the shorter and narrower rostrum, the differently coloured oral organs, the flattened frontal region, the differently formed labrum, the smaller size, the more shining and differently coloured upper surface, &c. All four examples are somewhat immature, and considerably lighter and less green in colour than in the figure given by Beck (tab. 5, fig. 27); the insect, nevertheless, could be thus identified. These specimens are coloured much as in *Rhinosimus planirostris*, and, indeed, bear a certain superficial resemblance (of course apart from the structure of the rostrum) to that common insect; they have long done duty in my collection for *S. æratus*, an insect not, I think, thoroughly understood by British Coleopterists.

Herr E. Reitter has kindly verified one of these examples as above.

For further particulars regarding *S. mutilatus* I must refer to Beck, Beitr. zur baier. Insekten, p. 19 (1817); Mulsant, Rostrifères, p. 41 (1856); Abeille de Perrin, Bull. Soc. Toulouse, viii, pp. 26 & 28, &c. The insect is found in France, Bavaria, &c., but not very commonly; M. Perrin (*op. cit.*) records it from Boscodon, in the Hantes Alpes, and says it is found in pine (sapin) faggots, in company with *S. æratus* and *S. foveolatus*.

NOTE.—I would here suggest the possibility of the occurrence of *S. Reyi* and *S. exsanguis*, Perrin, in this country; the former is very closely allied to *S. castaneus*, and the latter to *S. ater* and *S. æratus*; *S. Reyi* has been taken in abundance at Sos in the dead branches of fruit trees.—GEO. C. CHAMPION, 11, Caldervale Road, Clapham, S.W.: *November 13th*, 1886.

Coleoptera in the neighbourhood of Bath.—The highest ground about here is Lansdown, a large flat table land of Great Oolite without trees, elevation about 800 feet. It is divided into fields by loose stone walls, and the stones at their bases form a good collecting ground. I have taken here, amongst other things, *Cychrus rostratus*, *Amara bifrons* and *spinipes*, *Bradycellus distinctus*, *Trechus obtusus*, *Ocypus fuscatus*, *compressus*, and *morio*, *Xantholinus tricolor* and *fulgidus*, *Olisthopus rotundatus*, *Aphodius porcus*, *Barynotus obscurus* and *mœrens*, and *Otiorhynchus tenebricosus* in profusion. On the other side of the valley Hampton Down is not so high, but is fringed with woods; I have found there *Badister sodalis*, *Taphria nivalis*, *Platyderus ruficollis*, *Amara rufocincta*, *Trechus micros*, *Calathus piceus*, *Quedius nigriceps* and *rufipes*, *Staphylinus stercorarius*, *Aphodius obliteratus*, *sticticus* and *constans*, &c. Very near to the city is Little Solsbury, another good locality. It is a round hill with a flat top, at the base of which and at some distance from its sides is the Midford sand; the Inferior Oolite then follows, above which is a bed of the Fuller's-earth clay, and the Great Oolite caps the whole. On one side of it is a sloping sandy field, this is the locality for the *Onthophagi*; here *nutans*, *cœnobita*, and *fracticornis* are common, and *ovatus* abounds in sheep's-dung, also *Copris lunaris*, *Philonthus puella*, *Aphodius depressus* and *porcatus*, and all the commoner species. In a barren field near this spot, *Harpalus azureus* occurs in plenty, *punctatulus* sparingly, and *puncticollis* and *Brachinus crepitans* in company, but not *H. rufilabris*, which is found freely on Lansdown. Last season I found here one *Lebia chlorocephala*, also about twenty specimens of *Pterostichus picimanus* in a damp field on the clay near. In fields in the valley *Anisodactylus binotatus* occurs abundantly; *Pterostichus anthracinus* commonly, and many others more or less so, but I may mention *Stilicus geniculatus*, *Magdalinus barbicornis* and *Priobium castaneum*, the last rather freely. *Gyrinus marinus* abounds in the canal, and with it I took eighty specimens of *urinator* and one *bicolor* in a corner; *G. natator* is common in ponds. *Haliplus cinereus* occurs freely at Bitton Paper Mill, and *H. flavicollis* in the canal. —ROBERT GILLO, 16, Lambridge Place, Bath: *October*, 1886.

Note on Scotch Coleoptera.—Early in October I found *Aëpus marinus* and *Micralymma brevipenne* on the banks of the Forth at Culross, N. B., in the greatest profusion, and on the Moors near, *Acidota crenata*; on the Pentlands, *Bradycellus collaris* occurred commonly, and on Arthur's Seat I took *Agathidium rotundatum* and *convexum*.—A. BEAUMONT, 30, Ladywell Park, Lewisham, S.E.: *November*, 1886.

Cafius fucicola in Scotland.—I have this year met with *Cafius fucicola* in its old Scottish locality, Dalmeny Park, on the shores of the Frith of Forth. Dr. Sharp, in his Catalogue of Scottish *Coleoptera* (Scottish Naturalist, ii., p. 379), casts great doubt on the authenticity of the record by the Rev. Mr. Little in Murray's Catalogue; but it is undoubtedly *fucicola*.—R. F. LOGAN, Colinton, Midlothian: *November* 10*th*, 1886.

Sphinx convolvuli in the Isle of Purbeck.—As *S. convolvuli*, after appearing in such exceptional numbers last year, seems to have been decidedly scarce this season, it may perhaps be worth while recording the fact that I captured a specimen near here on the evening of the 7th inst. It flew in at the open window, evidently attracted by the light in the room; but, unfortunately, it is in poor condition.—Eustace R. Bankes, The Rectory, Corfe Castle: *October 20th*, 1886.

Great abundance of Plusia gamma.—During the present autumn *P. gamma* has appeared in swarms in this district, and was especially abundant during the mild weather at the beginning of October. They were particularly noticeable at dusk, when they hovered by hundreds round the flowers still remaining in the gardens. It would be interesting to learn whether the same phenomenon has been observed in other parts of the country, or whether this was only a partial visitation.—Id.

[*P. gamma* has been very scarce near London this year.—Eds.]

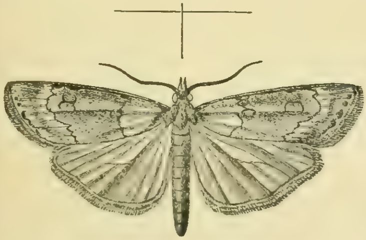
Anosia Plexippus, L. (Danais Archippus, F.) at Gibraltar.—A specimen of this most interesting butterfly was captured on the afternoon of October 24th, by Lieut.-Commander Cochran of H.M.S. "Grappler," in his garden at Rosia, at the foot of the rock, at rest on a bush of *Bignonia*. The insect, which I saw to-day, only just dead, in the possession of Lieut. Bolton, is a ♂ of average size and of the ordinary North American type; it is somewhat worn and faded, and one hind-wing is a good deal chipped; it looks as if it had been on the wing for a considerable time. I observe in Dr. Kelaart's "Flora Calpensis" (published in 1844) that no representative of the natural order *Asclepiadaceæ*, comprising the chief food plants of *Anosia Plexippus*, is found on the rock; but two of the *Apocynaceæ*, viz., *Vinca media* and *Nerium oleander* (the former wild, the latter cultivated) are abundant enough. If the larva will accept these as substitutes for its usual food plants (as it is said to do occasionally in South America with other "dogbanes"), I can imagine few places better suited, as regards climate, &c., for the ultimate naturalization in Europe of *Anosia Plexippus* than the rock of Gibraltar.—James J. Walker, H.M.S. "Grappler," Gibraltar: *October 26th*, 1886.

Acherontia Atropos in a bee-hive.—It is, of course, a very old story that *A. Atropos* enters bee-hives to steal the honey, but I do not know that one *often* hears of the great moth being caught *flagrante delicto*. However, I have lately heard of such a capture, and although I cannot give full particulars—it is hard generally *quite* to understand non-entomological reports of entomological facts—yet I believe there can be no doubt of the main fact in this case.

At a farm-house in the parish of Dartington, South Devon, on July 28th, 1886, the lads late in the evening noticed a peculiar noise at the bee-hives in the yard; they understood from it that some enemy was disturbing the bees, and called out the other members of the family to see what it was. Search was made, and one of the party with the kitchen tongs laid hold of the intruder, which, to the surprise of all, turned out to be a "great big moth," and continued to make the strange noise heard at first. It was covered with bees, and could not, or did not, fly; so, after the bees had retired, it was put under a tumbler, and kept there, till at the end of a fortnight it died. An entomological friend had the moth to set out, and he tells me there was no trace of any injury upon it, beyond that caused by the tongs. One would much like to have tested the theory that the peculiar squeaking of *Atropos* affects the bees so as to prevent them from hurting it.—J. Hellins, Exeter: *October* 16*th*, 1886.

Pterophorus dichrodactylus and P. Bertrami.—In August last, Mr. G. C. Dennis of York and I found *Pterophorus dichrodactylus* in plenty on our coast at Saltburn. In one of the ravines tansy grew in large and luxuriant patches, and on it *dichrodactylus* had evidently long been at home. Mr. Stainton (Ent. Mo. Mag., ii, 137), Mr. Barrett (Ent. Mo. Mag., xviii, 177), and Mr. Sang (Ent. Mo. Mag., xviii, 143), satisfactorily pointed out the differences between this species and *Bertrami*, but none of them have recorded one important particular, which, if necessary, still further strengthens their conclusion, namely, that *dichrodactylus* seems to be exclusively confined to tansy.* In the Saltburn ravine, and also all over the district, yarrow was in full bloom, and in equal luxuriance with the tansy, yet not a single specimen of *dichrodactylus* was ever seen frequenting it, or any other plant but tansy. *Bertrami* evidently did not occur in the district at all, or we think we must have seen it during our fortnight's stay. Heinemann records it as feeding on *Tanacetum* as well as *Achillea*, but probably Mr. Barrett is right in believing that to be an error. Many of the *dichrodactylus* we took were very worn, quite white indeed, but we each easily secured a good series of fresh and perfect specimens, which show the distinctions between it and the yarrow-feeding species—especially in the longer and finer pointed wing tips, and the yellower colour—most clearly. Any one having experience with both species *alive*, can scarcely help noticing the differences at once.—Geo. T. Porritt, Huddersfield: *November* 4*th*, 1886.

Eudorea ulmella, Dale, and E. conspicualis, Hodgkinson.—I have, for a long time past, thought it possible that these two names referred to the same species, and this suspicion has been confirmed by the inspection of the original specimens of *E. ulmella*, which Mr. C. W. Dale has kindly allowed me to see. There were originally three specimens taken in Hampshire, one of these is now in Australia, and the others are in Mr. Dale's collection. The specimen figured by Mr. Rye in Ent. Mo. Mag. for March, 1867, gives the idea of a narrow-winged insect, with a straight costa, but this is due to the fact that the edge and end of the wing are somewhat turned up in the specimen, and there is no difference perceptible in the costa when it is compared with ordinary small specimens of *E. conspicualis*. In marking also they are identical. Both specimens of *ulmella* are smaller than the usual run of *conspicualis*, but I have smaller specimens of *conspicualis*. It may be that the home of *conspicualis* is more northern, and that southern specimens are smaller; the figure is from one of Mr. Dale's examples, drawn by Mr. Sang.—Philip B. Mason, Burton-on-Trent; *November*, 1886.



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* Mr. Sang says (*l. c*) the larva feeds with us invariably in tansy; Mr. Barrett and Mr Stainton both state that the larva feeds on tansy, and do not mention or suggest any other food-plant. --Eds.

Heinemann's Dicrorampha.—Mr. C. G. Barrett's well-known accuracy in the differentiation of closely allied insects entitles him to considerable weight as an authority in such matters; I regret, however, that I cannot concur in his recently expressed opinion that *distinctana*, Hein., is separable from the North Devon *consortana*. No two of the bred specimens of the latter insect submitted to him, a few weeks ago, were exactly alike, but there were certainly among them specimens marked precisely as Mr. Barrett says his German types are, and I consequently feel no little surprise that the fact should have escaped Mr. Barrett's practised eye.—RICHARD SOUTH, 12, Abbey Gardens, London, N.W.: *November*, 1886.

[I willingly admit that no two specimens in the series of *D. consortana* submitted to me by Mr. South were exactly alike, any more than any two specimens of any other species, are *exactly alike*; but the variations were slight, and by no means suggestive of their belonging to more than one species. No one of them agreed with either of my authentic specimens of *distinctana*, Hein.; but I fear that I cannot more clearly describe the distinctions between them than I have already done on p. 142 of the present volume. The only point of difference in my opinion between Mr. South and myself now appears to be as to the distinctness of *distinctana*, Hein., from *consortana*.—C. G. B.]

On the flight and pairing of Hepialus humuli.—Some ten years ago, in the Ent. Mo. Mg. (vol. xiii, p. 63), I made a note of an observation on *H. humuli*. This was a solitary observation, and, therefore, not of much weight, but it met with sufficient scepticism to lead me to believe that the fact recorded was a new one, and though it is highly probable that similar observations have since been made and recorded, they have not come to my notice, until, by a curious coincidence, Mr. Barrett's observations on *H. hectus* this year. I was therefore pleased this summer to find *H. humuli* abundant in a meadow conveniently near, and devoted a short time on several evenings to observing its flight.

The first week in June is the usual date for its being fully out, but this year it was not out till ten days later, and it was not in full flight till the 4th week of the month, and it was on the long evenings following June 21st that I made my notes.

The flight lasts but twenty minutes, on a dull, overcast evening, from 8.50 to 9.10, and when the sky is bright and clear, from 9.10 to 9.30, beginning at the first indication of dusk, and ceasing when the white male becomes a somewhat dim object. At first, an odd male or two may be seen creeping up the grass stems and taking wing: often, at first, making a wild dash or two of some yards, before settling down to the ghost-like hovering, and before the vagaries of one or two specially observed have been noticed, the males are seen to have turned out in force, and to be busy hovering in all directions, and one will occasionally dash off for a few feet or yards and take up a fresh spot, or passing near another, will be followed for a short distance, and so it often happens that two males may be seen hovering close together, but taking no notice of each other. Meantime, sundry ♀ may be observed hovering over the tops of the grass, but instead of keeping to one spot, they steadily move forwards; when these pass near the hovering males, they rarely attract their attention, or only draw them out of position a few inches to at once return. The female moths acting in this way are ovipositing, dropping their eggs loosely into the grass, and if captured, continue to do so into the hand or into the box. But now and then,—I made the observation six times in four evenings—and from the number of ovipositing ♀, I have no doubt I was a day or two late, a ♀ moth courses along in a wilder manner, buzzes against or collides with, or appears to do so, a hovering male and settles as soon as her impetus is exhausted, on the grass a few feet in advance; the male, so challenged, follows almost simultaneously and settles immediately on the same spot.

On one occasion I had half a dozen ♂ *humuli* in view; of these, one was within two yards of me, another three or four yards further, and two more close together were further and a little to the left. Of these last, one was a very diminutive specimen; a ♀ *humuli* came up with a dash to the ♂ nearest me, but passed by within three or four inches without attracting his attention, then went straight for the second, but passed him by in the same manner, going for the two that hovered close together, touched the diminutive one, and at once settled down with him a few feet further on. This case emphasized two circumstances that I had already satisfied myself about, viz: that the female makes an actual selection, and that she actually strikes against the selected male. It also appeared that she had committed a serious error in selecting the smallest specimen of the four, and doing so apparently with decided intention. It has occurred to me, however, that the two moths hovering together were mistaken for one very large specimen; the silvery brightness of the ♂ is no doubt what the ♀ is attracted by, and an excess of this must be a determining point, and this may account for the decided tendency observed to two ♂ hovering together, or sometimes even three. One is tempted to theorise as to the diminutive antennæ being correlated with the ♂ not having to find the ♀ (by scent?), but the habits of other members of the family must be better known first.

When the twenty minutes of suitable light have elapsed, any male under observation flutters down into the grass, closes his wings and creeps down to the roots, and by the time one is satisfied that a secure hiding place till the next period of flight is his only object, it is found that all other specimens have also disappeared—the increasing darkness renders it impossible to say certainly whether all the ♀, which are now very inconspicuous on the wing, act in a similar manner, and I have not been heroic enough to ascertain whether or no another flight takes place in the morning twilight.—T. A. Chapman, Binghill, Hereford: *November* 11*th*, 1886.

Note on Aleurodes vaporariorum, Westw.—On May 18th, in Mr. Stainton's forcing-pit, the leaves of cucumber plants *(Cucumis sativus)* were in a state of dilapidation from the attacks of larvæ of *Aleurodes vaporariorum*; these having successfully passed through that transitory stage, and then that of pupa, had emerged in the unspotted whiteness of their perfect condition, and existed in great abundance on and flying about the plants. The under-side of the leaves was to a great extent covered by the empty pupa skins and a few larvæ, all tightly adherent; the rest of the space being mostly occupied by *Dactylopius destructor* in all stages of growth (*cf.* p. 154 *ante*), efficient assistants, if not prime movers in the havoc, leaving only small portions of the leaf free of tenants. In a microscope, under a half-inch objective, the larvæ with their projecting, glassy, transparent tubes on the circumference, and the very long, hair-like and extremely brittle ones on the back, so characteristic of the species, are wonderfully beautiful objects, or as Signoret not unaptly says (*l. c.*), "Cette magnifique espèce."

On October 8th Mr. Billups sent to me a box which contained some leaves of Tomato (*Lycopersicum esculentum*) which he had just received from a correspondent whose tomato plants were being ruined by the agency of the insects infesting them. The under-side of the leaves was to a great extent covered with the empty pupa-skins and a few larvæ of an *Aleurodes*; the leaves were much crumpled and somewhat dried, and in consequence the examination of the adherent insects was not easy, but on some of them there remained tubes on the margins, like those of *A. vaporariorum*, and on the dorsum long hair-like tubes (more or less broken) as in that species, so that I have no doubt of its identity. In the box which contained the leaves there were also a few of the perfected insects in bad condition, which had evidently emerged from pupæ during the transit.

The species was first described and figured by Westwood in the "Gardener's Chronicle," 1856, p. 852 (the figure only without name is again given in the same journal, February 13th, 1886, p. 213), from *Gonolobus*, *Tecoma*, *Bignonia*, *Aphelandra*, and *Solanum*. It was described by Frauenfeld in the "Verhandl. z.-b. Gesells. Wien," 1867, p. 798, but he does not give the name of the plant on which he says he reared it. It is described and figured by Signoret in the "Ann. Soc. Ent. France," 4 Ser., viii, p. 387, pl. ix, fig. 3, from *Salvia splendens* and *Lantana Cammara*. All the plants, as well as those now mentioned, are natives of tropical countries, and in northern climates require artificial heat and protection under glass. Belonging, as they do, to several Natural Orders, it is evident the species has a wide range of food-plants, on which, in their cultivated state, at all events, the insects cause great deterioration of growth.—J. W. DOUGLAS, 8, Beaufort Gardens, Lewisham: *November 8th*, 1886.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY, *Oct. 7th*, 1886: R. ADKIN, Esq., F.E.S., President, in the Chair. Mr. Billups exhibited *Echthrus lancifer*, Gr., a species of *Hymenoptera* new to Britain, taken by him at Walmer in August last. Mr. West (Streatham) exhibited a bred series of *Spilosoma fuliginosa*, L. Mr. Wellman, examples of second broods of *Melanippe tristata*, L., *Acidalia emarginata*, L., *A. rusticata*, Fb., and *A. strigillaria*, Hb., all reared from ova. Mr. Jager, *Callimorpha Hera*, L. (including the variety *lutescens*, Staud.), taken in the South of Devon; forms of *Bryophila muralis*, Forst., from Dawlish. Mr. J. T. Williams, *Eupithecia linariata*, Fb., bred from larvæ which fed up and emerged in about fourteen days. Mr. South, series of *Thera variata*, Schiff., from Switzerland, England and Scotland, and contributed notes thereon. Mr. Elisha, *Agrotis Ashworthii*, Dbl., and *Dasycampa rubiginea*, Fb. Mr. Adkin, *Lepidoptera* from East Sussex, among which were varieties of *Lycæna Icarus*, Rott., and *L. Corydon*, Fb., *Diasemia literata*, Scop., and contributed notes on the latter. Mr. J. J. Weir, a variety of *Pyrameis cardui*, L., from Graham's Town; varieties of *Colias Electra*, L., from the same locality, showing that the species exhibited a similar dimorphic condition to that which obtains in *Colias Edusa*, Fb. Mr. Cooper exhibited a brightly coloured variety of *Vanessa urticæ*, L. Mr. Sabine, varieties of *Papilio Machaon*, L., &c. Mr. Weir remarked on certain specimens exhibited by Mr. Sabine, which he referred to hybrids between *Lycæna bellargus* and *Icarus*. Mr. West (Greenwich) exhibited two species of *Coleoptera* from Shirley Heath, viz., *Balaninus rubidus*, Gyll., and *Erirhinus pectoralis*, Panz. Mr. T. R Billups, a species of *Hydradephaga*, *Colymbetes fuscus*, L., from which had emerged a

Lepidopteron, probably *Endrosis fenestrella*, Scop., Sta. The empty pupa case being partly visible and remaining firmly attached to the body of the beetle.—H. W. Barker and W. A. Pearce, *Hon. Secs.*

October 21*st*, 1886.—The President in the Chair. Mr. Billups exhibited the following *Ichneumonidæ*:—*Trogus lutorius*, Fab., and *T. alboguttatus*, bred from *Chœrocampa porcellus*, L., also *Apanteles jucundus*, Marsh., and cocoons. Mr. Levett and Mr. Watson, *Acherontia Atropos*, L. Mr. Helps, *Lasiocampa quercifolia*, L. Mr. West (Streatham), two yellow varieties of *Bryophila perla*, Fb. Mr. W. G. Sheldon, *Plusia chryson*, Esp., *P. festucæ*, L., *P. pulchrina*, Haw., &c. Mr. Fiklin, a long series of *Pædisca sordidana*, Hb. Mr. Jager, *Sphinx convolvuli*, L., taken at Starcross, Devon. Mr. Gibb and Mr. Tugwell, *Zygæna exulans*, Hoch., the latter gentleman called attention to two examples of the Swiss form of the species. Mr. Mera, *Eugonia autumnaria*, Wernb. (bred). Mr. Elisha, *Dianthœcia irregularis*, Hufn. (bred). Mr. Wellman, a number of species taken or bred during the season. Mr. Shearwood, preserved larvæ of *Toxocampa pastinum*, Tr., *Stilbia anomala*, Haw., *Nola albulalis*, Hb., &c. Mr. Adkin, *Polia flavicincta*, Fb. (bred); and on behalf of Mr. Farren, of Cambridge, long series of *Bryophila muralis*, Forst., *B. impar*, Warren, and *B. perla*, Fb., the first named from Folkestone, and the last two from Cambridge; and read a letter from Mr. Farren pointing out the distinguishing characteristics of *muralis* and *impar*. For the purpose of comparison, Mr. Wellman exhibited his series of *muralis*, and Mr. Jager, reddish forms of the same species from Folkestone. Some discussion then ensued as to whether *impar* was a distinct species or only a variety of *muralis*, in which Messrs, Weir, Tugwell, Wellman, Carrington and others took part.

November 4*th*, 1886.—The President in the Chair. Mr. E. Sabine was elected a Member. Mr. Billups exhibited seven male specimens of *Halictus xanthopus*, Kirby, from Reigate, and contributed notes. Mr. West (Streatham), *Eubolia cervinaria*, Schiff. (bred). Mr. Wellman, *Dasydia obfuscaria*, Hb., and *Eupithecia togata*, Hb. Mr. A. E. Cook, *Vanessa C-album*, L., from Wales. Mr. Jager, a variety of *Hypsipetes ruberata*, Frr., from Brockenhurst. Mr. Sheldon, dark forms of *Hypsipetes sordidata*, Fb., from Cadder Moss, Lanarkshire. Mr. T. W. Hall, *Cerastis vaccinii*, L., and *C. spadicea*, Hb. Mr. J. T. Carrington, six of the spurious varieties of *Vanessa urticæ*, L., referred to at the last meeting of the Society as having been offered for sale. Mr. R. South, *Gnophos obscuraria*, Hb., from Folkestone, the New Forest, Perthshire, North Devon and Lewes. Mr. Rose, *Lycæna virgaureæ*, L., from Norway, varieties of *Boarmia repandata*, L., from the Isle of Wight and the Lake District. Mr. Adkin, a variety of *Euchelia jacobææ*, L., in which the red markings were absent from the right wing. Mr. Chaney, the following *Coleoptera*: *Sphodrus leucophthalmus*, L., from Peckham, *Molytes germanus*, L., *Agabus nitidus*, F., from Sandown, and *Barynotus mærens*, F., from West Horsley. Mr. Billups, *Orthoptera*: *Gomphocerus rufus*, Ch., from Reigate; *Hemiptera*: *Corimelæna scarabæoides*, L., and *Sehirus morio*, L., both from Reigate.—H. W. Barker and W. A. Pearce, *Hon. Secs.*

Entomological Society of London: *November* 3*th*, 1886.—Robert McLachlan, Esq., F.R.S., President, in the Chair.

The following were elected Fellows, viz., Mr. Peter Cameron, of Sale, Cheshire; Mr. F. Archer, of Crosby, Liverpool; Mr. H. J. S. Pryer, of Yokohama, Japan (formerly Subscribers); Mr. H. Norris, of St. Ives, Hunts; Mr. N. P. Fenwick, of Surbiton Hill; Mr. John Brown, of Cambridge; Mr. J. P. Tutt, of Westcombe Park, Blackheath; and Mr. A. P. Green, of Colombo, Ceylon.

Mr. E. B. Poulton exhibited a mass of minute crystals of formate of lead, caused by the action of the secretion of the larva of *Dicranura vinula* upon suboxide of lead. He stated that a single drop of the secretion had produced the crystals which were exhibited; and he called attention to the excessively high percentage of formic acid which must be present in the secretion, and to the pain and probable danger which would result from being struck in the eye by the fluid which the larva had the power of ejecting to a considerable distance. A discussion ensued, in which Messrs. White, Kirby, Slater and others took part.

Mr. S. Stevens exhibited a specimen of *Laphygma exigua*, recently captured by Mr. Rogers in the Isle of Wight.

Mr. W. F. Kirby exhibited, and read notes on, a specimen of *Perilampus maurus*, Walk., recently bred by Mr. Walter de Rothschild from *Antheræa Tirrhea*, Cram., one of the rarer South African *Saturnidæ*.

Mr. T. W. Hall exhibited a number of specimens of *Xanthia fulvago (cerago)*, somewhat remarkable in their variation, and showing a graduated series, extending from the pale variety *flavescens* of Esper, to an almost melanic form.

Mr. W. C. Boyd exhibited, and made remarks on, the larva of a species of *Ornithoptera* from New Guinea.

Mr. H. Goss exhibited a series of *Bankia argentula* collected by him in Cambridgeshire, in June last; and also, for comparison, a series of specimens of the same species taken at Killarney in June, 1877. It appeared that the Irish form of the species was larger and more brightly coloured than the English.

Mr. Eland Shaw exhibited a female specimen of *Decticus verrucivorus*, Linn., taken in July last, at St. Margaret's Bay, Kent.

Mr. Waterhouse recorded the recent capture of *Deiopeia pulchella* at Ramsgate, by Mr. Buckmaster; and the capture of *Anosia Plexippus* at Gibraltar was also announced.

Mr. J. W. Slater read a paper on "The relations of insects to flowers," in which he stated that many flowers which gave off agreeable odours appeared not so attractive to insects as some other less fragrant species; and he stated that Petunias, according to his observations, were comparatively neglected by bees, butterflies and *Diptera*. Mr. Distant, Mr. Stainton, Mr. Weir, Mr. Stevens and the President took part in the discussion which ensued, and stated that in their experience Petunias were often most attractive to insects. Mr. Stainton referred to the capture by himself of sixteen specimens of *Sphinx convolvuli* at the flowers of Petunias, in three evenings in 1846.

Jonkeer May, the Dutch Consul-General, asked whether the reported occurrence of the Hessian Fly *(Cecidomyia destructor)* in England had been confirmed. In reply Mr. McLachlan stated he believed that several examples of an insect thought to be the Hessian Fly had been bred in this country, but that everything depended upon correct specific determination in such an obscure and difficult genus as *Cecidomyia*.—H. Goss, *Secretary*.

AËPOPHILUS BONNAIREI, SIGNORET.

BY E. D. MARQUAND.

It may be remembered that the first British specimens of this curious sub-marine Hemipteron were taken by the late Mr. Frederick Smith, some years ago, at Polperro, in East Cornwall, and their discovery was announced by Mr. C. O. Waterhouse in the Ent. Mo. Mag., vol. xviii, p. 145. Since that time the insect has not, so far as I am aware, been recorded from any other station, although, from a paper published in "Science Gossip," in March, 1886, it would seem to occur not uncommonly on the coast of Jersey. I have now the gratification of adding another locality, also on the Cornish coast, but some fifty miles to the westward of Polperro, viz., the rocks at Mousehole, near Penzance. The original specimens discovered at the Ile de Ré, in the Bay of Biscay, as well as those from Jersey, are said to have occurred under stones deeply embedded in mud or loose gravel; but my experience shows that these insects are not restricted to such habitats, but may be found on rocky shores as well, though always at the extreme verge of low water mark.

On November 12th last, I was searching for *Polyzoa*, during the low spring-tide, at Mousehole, about two miles from Penzance, when, at the very edge of the laminarian zone, I saw a remarkably fine specimen of the large star-fish, *Uraster glacialis*. I pulled it out of the cranny where it lay high and dry, and turned it over, and then saw, running swiftly over the slimy cream-white under-side of the star-fish, a minute object, which I took for an *Acarus*, and "bottled." A moment's glance with the lens, however, showed me it was a bug of some sort, and a careful examination of the *Uraster* furnished three mature examples, which I secured. Immediately on my return home, I forwarded one of the large specimens alive to Mr. Edward Saunders who kindly replied at once, confirming my suspicion that it was *Aëpophilus Bonnairei*.

Why a small colony of these *Hemiptera* should have selected this particular star-fish to locate themselves upon, I cannot conjecture, because I have examined scores of the same species at various seasons of the year on the same rocks and never saw an insect upon any. The coast just here is entirely rocky, so that *A. Bonnairei* is by no means confined to muddy or sandy shores, and this may serve as a hint to those who are on the look out for the insect.

I ought to mention that this is not the first time I have met with it. About two years ago, also at Mousehole, I captured two specimens among stones at low tide, but these I unfortunately lost before they were identified.

That it is very local and rare in the extreme west of Cornwall, I am convinced, for during the last six or seven years I have worked the shore a good deal, both about Penzance and in many parts of the Land's End district, and I never met with it save on these two occasions. There is no reason why it should be confined to the Cornish coast, and we shall probably soon hear of its occurrence in other districts.

If this singular Hemipteron should turn up in some strange situation, it may be at once recognised by its general resemblance, roughly speaking, to a medium-sized, rather narrow, bed-bug, with partially developed, velvety, mottled-brown elytra, and very prominent eyes of a brilliant ruby-red.

Alphington, Exeter:
November 29*th,* 1886.

[The association of *Aëpophilus* and *Uraster* may not indicate any important significance; but it is suggestive and decidedly worthy of further investigation.—Eds.]

COLEOPTERA AT PORTLAND.

BY JAMES J. WALKER, R.N., F.E.S.

The following notes on the *Coleoptera* of the Isle of Portland and the Chesil Beach, made while I was stationed there in H.M.S. "Cherub," from June, 1885, to the beginning of last October, may be worth putting on record, though the localities have already been fairly well worked. It will be seen that I have been fortunate enough to meet with most of the Portland specialities, although, having been absent on many occasions during the above period, often for several weeks together in the best part of the season, many species which ought to have been taken in plenty (as *Omophlus armeriæ,* &c.), have been found by me but rarely. A short description of the localities may be of interest.

The Isle of Portland, as it is called, though really a peninsula joined to the mainland by the narrow isthmus of the Chesil Beach, is, as is well known, mainly a huge mass of oolitic limestone, varying in elevation from nearly 600 feet at the north end, to less than 60 feet at the southern extremity at Portland Bill, the slope being very regular from north to south, and the surface fairly uniform, except where cut up by the extensive quarries. The east and west shores of the island are bold and rocky, in most places quite perpendicular, though there are some very nice bits of rough broken undercliff here and there on the eastern side, which produce a very varied and interesting vegetation, and are the best localities for *Lepidoptera* in the island. Few beetles are to be found here however, the best place for these being the summit of the western cliffs, and near the Bill, where, under the innumerable loose stones, many interesting *Geodephaga*, &c., are to be found—not to mention a superabundance of earwigs, snails, slugs, ants, and especially wood-lice, which latter vermin are in greater profusion at Portland than I have anywhere else seen them. The quarries as a rule are unproductive, nor have I found any good *Coleoptera* on the steep flowery slopes on the north front below the Verne Fort.

The Chesil Beach is even more interesting, being a long, gently curved ridge of rounded pebbles, extending from Portland to beyond Abbotsbury, a distance of more than ten miles, its average width being about 200 yards, and in height some 30 feet above high water mark. A large shallow lagoon, called the "Fleet," is shut off from the sea by the pebble ridge, and opens into Weymouth Bay by a narrow mouth, crossed by a wooden bridge known as the Ferry Bridge. Adjoining this bridge, on the Portland side, is a narrow strip of low sand-hills, intersected by the railway and the road to Weymouth; these are covered with a profuse and varied growth of flowers in the summer (*Ononis*, *Anthyllis*, *Lotus corniculatus*, and *Armeria vulgaris* forming the chief part), and are most delightful collecting grounds. Sweeping is, however, of very little avail (as in Portland); the only beetle which appears to frequent the flowers being *Dolichosoma nobile*, which occurs in vast profusion on the thrift blossoms in June. On the right of the road, looking towards Portland, are some damp saline hollows between the road and the pebble ridge, swarming with *Bledii*, *Pogoni*, *Dichirotrichus* of both sexes, *Broscus*, &c., and at low water a wide expanse of tidal sand is exposed at the end of the "Fleet," which is always worth inspecting. Close to Portland Station the sand-hills disappear, the road and railway running close to the beach, but there are some very good places at the foot of the railway-bank, on which *Crithmum maritimum* grows in abundance.

Among a large number of species of *Coleoptera* met with, the following appear worthy of record:—*Cillenus lateralis*, plentiful, in early summer, on tidal mud and sand near the ferry bridge; *Adelosia picimana*, abundant under stones in very dry places on the west cliffs; *Amara convexiuscula*, with the preceding, not rare; *Licinus silphoides*, common, and generally distributed, occurring all over the island as well as on the beach ; *Masoreus Wetterhali,* common on the beach, most plentiful in August, under stones, also in moss in the winter ; *Cymindis axillaris,* scarce, on the west cliff. The genus *Harpalus* is very well represented at Portland, as, besides the universal *H. ruficornis* and *proteus,* I have met with, on the west cliffs, *H. sabulicola* (fairly common), *rotundicollis* (abundant), *azureus* (not rare), *puncticollis* (common, with one or two specimens which appear to be *parallelus,* Dej.), *rubripes* (common, also on the beach), and *caspius* (very plentiful, an entirely black variety, not rare) ; while on the beach *H. attenuatus, neglectus* (not rare), *melancholicus* (one specimen only in June, 1885), *serripes* (common), *anxius* (abundant), and *vernalis,* have occurred, the last-mentioned at rare intervals, and always singly ; *Scybalicus oblongiusculus,* evidently rare, as I took only one specimen, in September, 1885, on the west cliffs ; *Bryaxis Waterhousei,* abundant in saline spots near the railway bank, also on the island, near Portland Bill ; *Claviger foveolatus,* very plentiful in nests of *Lasius flavus* (I have found over 40 in one small nest), more rarely in those of *L. niger ; Phytosus spinifer* and *balticus,* plentiful on sunny afternoons in holes in the sand dug as traps for *Acritus punctum* (p. 16), on one occasion over 60 specimens of *P. balticus* were taken out of one small hole ; *Homalota cæsula,* abundant in short moss on the sand, in winter and early spring, also under stones ; *Lithocharis fuscula,* one only, on the railway bank ; *Diglossa mersa,* frequent in sand-holes, also running over wet sandy mud below high water mark ; *Staphylinus stercorarius,* a few under stones on the west cliffs, in August ; *Ocypus ater,* common, and generally distributed ; *Philonthus fucicola,* in seaweed, not common ; *P. sericeus,* frequent, in sand-holes ; *Xantholinus tricolor,* common, under stones on the west cliffs ; *Bledius spectabilis,* very abundant in sandy mud near the ferry bridge, but difficult to obtain in any numbers, owing to the depth to which it burrows ; *B. tricornis,* in a moist saline place (an old raised beach) near Portland Bill ; *B. unicornis,* very plentiful in May, with *spectabilis* ; and *B. arenarius,* extremely abundant in tidal sand, accompanied by *Dyschirius thoracicus* in numbers ; *Oxytelus maritimus,* very plentiful in tidal refuse, and "traps ;" *Trogophlœus halophilus,* locally common under small stones in a saline place by the railway bank ; *Ptenidium punctatum,* plentiful in "traps" in the sand ; *Platynaspis villosa,* one specimen, Chesil Beach, by cutting grass tufts in January ; *Carcinops minima,* frequent, under stones and in moss ; *Throscus obtusus,* one specimen only, in a haystack near Wyke Regis, in February ; *Cardiophorus asellus,* fairly plentiful for about a fortnight, at the end of April and beginning of May, under stones on the sand-hills ; *Chrysomela hæmoptera,* very abundant in the same locality ; *Omophlus armeriæ,* very local on grass and herbage near the ferry bridge : unfortunately, I missed the best time for this fine insect, and took only a few specimens ; *Anthicus Schaumi,* locally plentiful (most abundant in August) under small stones, &c., near the bridge ; *Nacerdes melanura,* not rare, about old timber, &c. ; *Trachyphlœus alternans,* only one, in an ant's nest ; *Otiorrhynchus ambiguus,* common in the spring under stones, &c., on the beach ; *Sitones Waterhousei,* abundant on *Lotus corniculatus,* and *Orthochœtes setiger,* at roots of herbage on the beach, also in tufts of grass in the winter ; *Rhinocyllus latirostris,* occasionally on road-side thistles on the island ; *Mecinus circulatus,* two or three in moss on the beach ; *Tychius Schneideri,* one only, on the east cliffs, in June ; *Sibynes arenariæ,* locally abundant at roots of *Arenaria marina,* near the railway bank ; *Baris laticollis,* occasionally crawling on walls (I could not find its head-quarters); and one or two *Hylastes obscurus*, by casual sweeping. *Acritus punctum* continued to occur in fair abundance up to the end of May, but only one more *Pentarthrum Huttoni* (p. 17) was obtained, in exactly the same spot as the first two specimens, though I spent a good deal of time in endeavouring to trace the insect to its head-quarters.

H.M.S. "Grappler," Gibraltar:
November 4th, 1886.

FURTHER NOTES ON THE DEVELOPMENT* OF THE EMBRYO IN EGGS OF *BOTYS HYALINALIS*.

BY W. R. JEFFREY.

On the 1st of August last, having secured a batch of nine of these singularly flat and transparent eggs laid on a slip of glass, I kept them under the microscope during the 12 days of incubation, watching them as frequently as possible, and making notes of what I saw.

As some extracts from these notes may interest your readers, I make the following selection:—

When first laid, the contents of the egg seem of a perfectly homogeneous fluid nature.

In 8 or 9 hours after, the contents show as fine granules of yolk slightly denser in the middle of the egg—the blastoderm can be already traced as an extremely fine marginal line, which, at some parts, the granular contents did not quite reach, the margin of reticulated chorion showing as a clear space all round.

When about 12 hours old, the mass of yolk-granules were observed to be closer to blastoderm all round, but the outline of the latter had become irregular and depressed on one side.

In 15 hours, this depression had increased to a sharp angle, but in another hour, had returned to its original contour, only with a slightly increased space of clear shell beyond.

When 22 hours old, the margin was observed to be crenated with protuberances—from the aggregation of granules having the appearance of nucleolated cells—but general contour regular.

These irregularities of the margin of the yolk-sac had increased by next morning, with one large, almost triangular, hump at one place.

Some 28 hours had now elapsed since the eggs were laid.

When 30 hours old, the first faint signs of transverse septa noticed, caused apparently by the folding in of the yolk sac to form the amnion. It had the appearance of a melting away of the granules.

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* Dr. Osborne has an article on this subject in No. 242 of Science Gossip for February, 1885, where, at p. 33, a few figures are given.

Rapid changes now take place in the outline of the yolk-sac, appearing as if broken at one side, and sometimes at both sides, as the amniotic sac is being folded in from it, in 38 hours there is a fold from the other side, and in 40 hours these two masses unite, when it bears a fanciful resemblance to a cottage loaf.

The outer mass of yolk is now composed of spherules containing granules, very irregular in outline, and broken as it were on each side, continually changing its shape, with a flowing and pressing motion on the inner sac. In 44 hours, central mass melting into one rounder mass, and in 48 hours, the outer mass or annulus of yolk, closing round still more, with a slender scroll just traceable at one side of the inner sac.

In 54 hours, this scroll has developed a funiculus, connecting the embryo with the annulus of yolk ; the inner sac is now distinct enough with the oval outline of the egg.

The development of the embryo now proceeds in this inner sac, the ends curving twowards the funiculus till it comes to resemble somewhat the section of an agaric. In 60 hours, it is curved still more.

In 72 hours, it may be compared to the capital of an Ionic column; it now becomes flattened ventrally with the faintest indication of segments forming at this part. A clear concentric line is now left between the developing embryo and the amniotic sac. The yolk-granules are now arranged in loose masses in the annulus, so much detached, in some places, as to leave a clear space through which you could see the distal chorion. Now about 80 hours since the eggs were deposited.

We have now reached the *Fourth day* of incubation. Up to this time, great changes had taken place in the outer mass or annulus, but, after this, it is subject to but little change, except in diminution of bulk, as the yolk granules are absorbed by the growing and continually changing embryo. Towards the close of the fourth day, the embryo was observed to have increased in bulk with a peculiar bladdery appearance, and a clear fissure in funiculus. Three hours later, this clear space becoming obliterated, as also those in annulus noticed above. The yolk-granules becoming denser, especially at micropylar end where the annulus is broadest, and the spherules closer. At the close of this day, the ventral segments becoming better defined, though much obscured by yolk-granules of annulus.

Fifth day, at 7 a.m.—The scrolls formed by the embryo losing their double character, being so much obscured at head end (in all cases towards the micropyle), that the tail comes to look more like a horn. At 7 p.m.: granules clearing away from margin of embryo, leaving the crenated edge, forming into segments, more discernible. 10 p.m.: indication of legs budding on some of them.

Sixth day, 7 a.m.—Clear space at margin of embryo increased, so that 9 ventral segments could be distinctly counted. 11 a.m.: funis dwindling more into the "bird's beak" form, curved and darker. At 5 p.m.: the 12 segments on the ventral region can now be made out, and the six thoracic legs. At 7 p.m.: everything getting more distinct, with sundry outlines of the head, and even the eyespots appearing as minute brown dots in clusters of six. At 11 p.m.: a slight indication of incurvature of tail in the most forward specimens.

Here I must acknowledge the kindness of Dr. T. A. Chapman, of Hereford, in allowing me to see a number of drawings taken from another lot of these eggs, which I had the pleasure of sending him. They were 7 days in advance of those I was observing, his figures commencing July 31st, being in the sixth day of incubation. In most cases showing only the embryo, and taken on a large scale, with the aid of a camera lucida, they give the details very plainly. Special attention was given by Dr. Chapman to the segmentation, and his drawings may be said to contribute to the evidence already recorded in favour of the head consisting of four segments.

Seventh day, 5.20 a.m.—The terminal segment has become ventrally incurved, gradually increasing in length. This incurvature perceptibly increased in two hours more, with outline of anal segment, the thoracic legs become jointed, and projecting into clear concentric space, pointing towards the tail. Soon after noon, the anal segment had reached to the first pair of thoracic legs, and I could plainly *see it advancing towards these legs, and actually push them forwards in its course.* At 6 p.m. the anal segment had reached quite to a level with the eye spots—pressing all the thoracic legs down in its course. While this has been going on, the abdominal legs have developed, and now show plainly in the arch of the loop, though not so much so as the thoracic legs, and taking a different direction from the torsion now setting in. With this rapid growth of the dorsal region, the umbilical stump has been drawn out as it were into a dark, curved, club-shaped mark, following the growth onwards, and persisting as the intestine. At 9 p.m.: dorsal region still extending, and now showing segmental divisions corresponding with the ventral. Those most advanced show the torsion of the head now taking place, by the increasing distance between the eyes, both now becoming very plainly visible.

Eighth day, 7 a.m.—Fine dark yolk-granules are flowing over the head and into the loop, obscuring more or less these parts. At 9 a.m., these granules clearing away somewhat, so that final curve of tail could be seen commencing, and apparently clearing away the yolk-granules that it may have forced into the centre loop. At noon, the tail more decidedly working round, the anal prolegs projecting plainly into the loop. Soon after noon the first larval movement was noticed, being a decided heaving of the abdominal segments throughout their length, leaving the anal prolegs more compact in the centre, while the whole body seemed to get at once closer to the now narrowing annulus. 5.30 p.m.: this movement continued in others, as the final curving of the anal segments became complete. 6.30 p.m.: a string of fine clusters observed in dorsal region, indicating position of dorsal vessel. Intestine continues dark, and ends apparently rather abruptly, but a delicate outline, as of the bowel, can be traced beyond, in the posterior segments.

Ninth day, 7 a.m.—Dorsal vessel become more decided. Serous membrane distinct enough, and the outline of the amniotic sac still to be traced. Eyes become darker and more contracted and crescentic. Outlines of oral organs appearing. 9 a.m.: first pulsations in dorsal vessel noticed at intervals of from 20 to 30 seconds. At noon, timed again about the same. At 5 p.m.: a little more frequent; counted occasionally from 7 to 11 p.m., with a similar result. Posterior bowel more plainly seen, also a sort of tube each side of the intestine, as it were enclosing it.

Tenth day, 7 a.m.—Counted pulsations at intervals of 15 seconds, though still irregular, as sometimes they may be noted 10 seconds, or even less apart, at other times there would be a rest of 20 seconds or more. At 9 a.m.: counted five or six beats per minute. Serous membrane plain enough as a fine marginal line; another, but very faint, line, still marked the amniotic sac as being entire, but difficult to distinguish from dorsal margin of body. Balls of yolk-granules collecting near mouth parts; æsophagus just becoming visible in outline. 3 p.m.: circulation more regular, counted for several consecutive minutes six beats per minute. Serous membrane easily traced, but the line marking amniotic sac with difficulty. Soon after this, thorax seemed detached from annulus, leaving an oblong mass of granules on the annulus, where it had been attached. Simultaneously with this, the first *efforts* at deglutition in œsophagus were noticed, but nothing drawn down at present; and, as more than twenty hours elapsed before yolk-granules were taken in at the mouth, it is very probable, as Dr. Chapman suggests, that nutriment is absorbed by cutaneous endosmosis during this interval. At 4.30 to 4.35 p.m. the first tracheæ came suddenly into view. As the tracheæ were almost invisible in some of the other larvæ, I watched one closely, with the view of noting the cause of their so suddenly becoming conspicuous, when at 5.10 to 5.15 p.m. I distinctly saw them injected, as I suppose, with air for the first time. 5.15 p.m.: the filling of the tracheæ commenced in the posterior segments, a sort of cloud gathering at the bend where it is close to the head, and in a line with the eye. I saw *an apparently dark fluid start from this spot, and creeping along with a sort of spasmodic effort, filling the branches in its course, till it reached the head, and the whole tracheæ became conspicuously visible on that side of the body.* At 6.30 p.m. another egg was watched, which gave indications of the tracheæ being about to be filled, in the shape of a dark blotch, on the bend of the body, by one eye. The appearance of this blotch is preceded by a dark cloud of granules from the annulus, which, from the pressure of the growing larva, is forced here between the head and the curve of the body, as the only part where it can find access—and, I apprehend, it is now that the amnion is ruptured—admitting air to the tracheæ. Certain it is that after the injection of the tracheæ, it was in vain to look for any other envelope than the outer one, or serous membrane. 9 p.m.: tracheæ developed in all except No. 2 egg. 11 p.m.: pulsations but little increased, at the most, eight per minute.

Eleventh day, 4.30 a.m.—Tracheæ not yet to be seen in No. 2 egg. At 7 a.m., by *carefully examining, could define the margin of the amniotic sac in some parts of this egg still*, as it must be 16 or 18 hours behind the others. The mouth parts still hyaline in this one, but chitinized in all the others, though even these do not appear yet to have drawn in any yolk-granules by the mouth, a deal of motion going on in the alimentary canal extending to the anal segment, which, at 9.15 a.m., was observed in one egg to have a motion of the anal flap, as of suction, opening and shutting. 11 a.m.: soon after this, tracheæ appeared in the retarded No. 2 egg, and ingestion of yolk-granules was first observed in the advanced ones, No. 1 especially, vigorously drawing them down at 12.30 and 1 p.m., with a deal of motion of the intestine, but granules do not appear to go further than end of crop, where they are in a continual bubbling state. This condition of things continued during the afternoon; pulsations not much increased, 8 to 12 per minute, but difficult to count from the other incessant internal motion. 7.30 p.m.: the hairs appearing faintly in the advanced ones. 9 p.m.: serous membrane traceable in most of the eggs, but could not distinguish it in No. 1, the most forward, where nearly all the yolk is consumed, and the hairs can now be seen, springing up beyond where the attenuated membrane was, an hour or two since. 10.30 p.m.: the retarded No. 2 not begun to devour yolk yet, but the peculiar gaping movement of anal segment observable; the others all still busy swallowing the remains of yolk.

Twelfth day, 7 a.m.—No. 2 has *begun* to ingest yolk, the *others* pretty well devoured it all, but still a deal of wriggling motion with these, so as to make it difficult to distinguish pulsations fairly, counted several times, at 8 a.m. twenty beats per minute, at noon thirty beats per minute, at 4 p.m. thirty-five beats per minute, increased still more at 5.15 p.m., but the activity of the young larvæ was very great in their evident efforts to nibble the shell, which was at last accomplished, first by No. 7, exactly at 5.30 p.m.; before it was half out, No. 8 began, followed by Nos. 6, 4, 5, and 1, coming through so quickly that by 5.35 *all*, except the retarded No. 2, had escaped and commenced cleaning themselves and devouring their egg-shells. Eggs 3 and 9 were small and barren from the first.

And now I have a little tragedy to record. The unfortunate No. 2 was doomed to fall a victim to its tardiness; its brethren, when eating up their own egg-shells, made an opening in this No. 2, and I saw the air rush in, to the discomfort of the helpless tenant, not yet ready to avail itself of the opening made, consequently it was killed, literally torn to pieces by its comrades, who, finding this egg a more moist and dainty morsel than the other shells, set upon it, two or three at a time, and I actually saw one rise with a shred in its mandibles, and another raising its anterior segments, endeavouring to take it away: thus early fighting as it were over the remains of their less fortunate companion. It may be queried whether this would have happened under more natural conditions, but as young larvæ are well known to eat their egg-shells the first thing and to thrive the better for it, I am inclined to think that, at least with eggs deposited in this imbricated manner, it may occasionally happen. After witnessing this performance, I put a piece of a leaf of knapweed on the glass slide, still on the stage of the microscope, the larvæ soon found it, and at 6 p.m. I removed them to a jam pot containing some larvæ which had emerged a few days before, and established themselves on leaves of *Centaurea nigra*, making blotches from the under-side to the upper cuticle.

Ashford, Kent:
November 6th, 1886.

SUPPLEMENT TO ANNOTATED LIST OF BRITISH *ANTHOMYIIDÆ.*

BY R. H. MEADE.

Since the last portion of my List was published in October, 1883, I have found a few British species of *Anthomyiidæ* which appear to be new, and a considerable number of others which were unknown to me at the time of the compilation of my paper. I purpose, therefore, to go through the different genera into which the Family has been divided; shortly to describe those species which seem to be new; to record all additional ones which have come under my notice; to amend several errors into which I had fallen; and, finally, to add a few supplementary remarks, which may be of interest.

POLIETES, Rond.

The few species included in this genus resemble some of the true *Muscidæ*, by having their bodies softer and less spinose than those of most of the other larger *Anthomyiidæ*; Rob. Desvoidy, therefore, placed them in his genus *Macrosoma*, between the genera *Graphomyia* and *Mesembrina*, but, as he afterwards acknowledged, this was a mistake, for the widely open extremity of the first posterior cell of the wing is an essential character of all Anthomids.

P. HIRTICRURA, *sp. n.*

Mas, cæruleo-nigra nitida, parce tenuiterque setosa. Thorax vittis albidis striatus. Abdomen glauco-cinereum, linea dorsali nigra, tessellisque nigris signatum. Oculi longe-hirti. Calyptra squamis aureis. Halteres obscuri. Alæ hyalinæ, nervis transversis obliquis, sed rectis. Tibiæ posticæ arcuatæ, denseque villosæ. *Long.*, 9 *mm.*

Male, shining steel-blue; antennæ, palpi and legs black.

Head: eyes sub-contiguous, thickly clothed with long yellowish hairs; face with glistening white reflections; cheeks small and reddish-brown; mentum grey, thickly clothed with black hairs and bristles; vibrissæ extending about half way up the facial groove; antennæ rather short, third joint scarcely twice as long as the second; arista long, thickened at the base, thinly clothed with hairs of a moderate length to a little beyond the middle, extremity long and bare.

Thorax with *scutellum* shining blue-black; the former is marked with five silver-grey longitudinal stripes, which are very distinct at the sides and front margin, but become pale behind; they divide the dorsum into four blue-black bands, the outer pair of which are twice as wide as the inner pair; the dorsal bristles are small and weak, but the sides are furnished with numerous hairs and setæ.

Abdomen bluish-grey, showing white and black reflections; it is marked down the back with a longitudinal central black stripe, which is dilated into a large triangular spot on the posterior margin of the second segment, and into a similar smaller one on the edge of the third; there are very few bristles, except upon the sides and apex.

Wings hyaline, yellow at the root; there is no costal spine; the internal transverse veins are placed opposite the termination of the auxillary veins; the external transverse veins are nearly straight, but placed obliquely.

Calyptra have yellow scales with bright orange margins.

Halteres small, with dull yellow stalks and grey heads.

Legs rather long; middle tibiæ with a series of bristles of moderate and equal length along the whole of their external and posterior surfaces, and also with a number of long spines at their extremities; hind femora clothed with long soft hairs; hind tibiæ distinctly curved towards their extremities, furnished with long hairs on the whole length of both their outer and inner sides, and with a series of spines on their posterior surfaces.

This species seems to be rare. I have only seen a single male, which I captured in August, 1883, in the Woods near Bolton Abbey, in Craven, Yorkshire. It bears a considerable resemblance to *P. albo-lineata*, but differs from it by being larger, by having four instead of two wide stripes upon the thorax, by the hind tibiæ being curved and very hairy, as well as by other characters.

HYETODESIA, Mde.

H. TRIGONALIS, Meig.

This species, which is abundant in the Lake District about Windermere, as well as in the South of England, was recorded in my list under the name of *H. læta*, for which I mistook it. Mr. Verrall pointed out the error to me, and has recorded the name of the fly in his " Hundred New British Species of *Diptera*;" he includes it, however, in the genus *Spilogaster*, but the eyes are distinctly hairy (the cause of my mistake), therefore, it must be correctly placed among the *Hyetodesiæ.* It resembles *H. læta*, and also *Spilogaster fuscata*, by having a series of triangular black marks down the back of the abdomen. It differs from *H. læta* (which has not yet been recorded as British) by having, like *H. serva*, only three posterior dorsal bristles on the thorax in the two parallel rows of setæ which are placed in the space between the middle and lateral stripes, while there are four in *H. læta*; the eyes of the male are also closer together (being contiguous) in *H. trigonalis* than in *H. læta*, in which they are only approximate; the scutellum has two lateral black marks in the former, while there is only one basal mark in the latter; the tibiæ also are much lighter in colour in *H. trigonalis* than in *H. læta*. It may be at once distinguished from *S. fuscata* by the eyes being hairy.

H. BASALIS, Zett.

In the female of this species the eyes are almost bare, therefore, unless examined under a strong lens, it may easily be mistaken for the female of *Mydæa urbana*, which differs from the male in having the fore femora yellow like the posterior ones; the former species may, however, be easily distinguished from the latter by the form of the epistome, which is much more prominent in *H. basalis* than in *M. urbana*.

H. SIMPLEX, Wied.

When I published my list I had only seen a single female of this rare species, which I captured near Edinburgh in August, 1875; in August last (1886), however, I found several males near Ulverston, Lancashire. It is a pretty, well-marked species. The hairs upon the eyes, as well as those of the arista, are short; there are only three posterior thoracic dorsal bristles, as in *H. serva* and *H. trigonalis*, and the first and second rings of the abdomen are red and translucent. Meigen described the male and female under different names, the former being his *A. posticata*, and the latter the *A. simplex* of Wiedemann. In his 7th and Supplementary Volume he places the latter in his genus *Aricia*, as having hairy eyes, whilst he puts the former among his *Hylemyiæ*, which have naked eyes. Both sexes are well described by Zetterstedt.

SPILOGASTER, Macq.

S. TETRASTIGMA, Meig.

This rare species was recorded as British and briefly described by Walker in the Insecta Britannica, but I never saw a specimen until August last (1886), when I captured several males as well as females near Ulverston, Lancashire; the latter sex was previously unknown.

The male and also the female have the thorax marked with four longitudinal black stripes, the outer ones being broad, irregular in shape, and interrupted at the suture. There are only three dorsal bristles, behind the suture, between the middle and lateral stripes; the abdomen in the male is marked by four and sometimes by six dorsal spots, which are, in some specimens, rather indistinct; the female has the abdomen immaculate, and of an uniform pale grey colour; the antennæ are entirely black in the male, but have a more or less rufous tinge on the two first joints in the female; the palpi are black, with yellow roots, in both sexes; in the male the legs have the coxæ, tarsi, bases, and proximal two-thirds of the upper surfaces of the fore femora, as well as the bases of the posterior femora, black, and the rest of the legs yellow; in the female the coxæ, all the femora (except sometimes the bases of the fore pair), with the tibiæ are yellow, and only the tarsi are black; the latter sex has also the posterior margin of the scutellum flavescent.

The female, which has evidently been overlooked, owing to the absence of the abdominal spots, bears a very close general resemblance to both those of *Mydæa impuncta* and *M. separata*; it may be known at once from the former by the colour of the palpi, which are entirely yellow in *M. impuncta*; from *M. separata* it may be distinguished by the arista being much longer haired, and by its having only three dorsal thoracic bristles behind the suture, while *M. separata* has four, as is also the case with *M. impuncta*.

S. PERTUSA, Meig.

This species has been recorded as British by Mr. Verrall, in his "Hundred New British Species of *Diptera*." I have not been so fortunate as to meet with an English specimen myself.

S. FLAGRIPES, Rond.

By mistake the name of this species was written *flagipes* in my list.

(*To be continued*).

NOTES ON *LEPIDOPTERA* IN SWITZERLAND IN 1885—86.

BY A. H. JONES.

I arrived at Saas-im-Grund in the Valais on the 22nd of July, 1885, where I met the Rev. J. C. W. Tasker and several other entomologists. Here I remained ten days, and I have a very pleasing recollection of the various excursions made in the neighbourhood.

The Saas Valley, like most of the lateral valleys of the Rhone, appears to be rich in *Lepidoptera*, especially in butterflies. The collecting ground commences at Stalden, the well-known halting station for visitors to Zermatt; from this point to the Mattmark See there is a difference in elevation of about 4200 feet, consequently a variety of species occur. After leaving Saas I spent a week in the Vallée des Ormonts, where I met with many species not taken in the Saas Valley.

In 1886 I spent the first week of June at Brunnen, on the Lake of Lucerne. In this well sheltered spot there appeared to be an abundance of insect life. The next point reached was Andermatt; here the weather was so bad that I had but little opportunity for collecting, yet, during the few intervals of sunshine, it was surprising to find so many butterflies on the wing; *P. Machaon*, for instance, was very abundant, and many other species were equally plentiful. I reached Zermatt at the end of June. The following is a list of species met with. I have added, as nearly as possible, the elevation at which they occurred. The elevations of the places often quoted are—

Brunnen	1434 feet.	Saas-im-Grund...	5125 feet.
Stalden............	2736 „	Zermatt	5315 „
Andermatt	4738 „	Mattmark See ...	6965 „

Papilio Podalirius, not uncommon in the Saas Valley, up to 3000 feet. *P. Machaon*, very common and fine in meadows, Andermatt, up to 5000 feet, in June; second brood in the Saas Valley in July.

Parnassius Apollo, generally distributed and common, from 1500 to 5500 feet; more abundant at the end of July than in June. *P. Delius*, common in the Saas Valley, 5600 feet; more local than the preceding species, and does not appear to wander far from the streams where *a species of Saxifrage* (the food plant of the larvæ) grows; the butterfly was also common in the middle of June at Andermatt.

Aporia cratægi, one of the most abundant and generally distributed butterflies; very plentiful at Brunnen and in the Rhone Valley, but most abundant in the Saas Valley (up to 4000 feet); at Stalden it positively swarmed, and 20 or 30 specimens might be seen resting together on the muddy places in the path—June.

Pieris brassicæ and *rapæ* were common at Andermatt in June, and were identical with the specimens occurring in England. *P. napi* was also not uncommon; the males were of the usual form, but the females were all of the variety *bryoniæ*. *P. Callidice*, I found the males of this "mountain white" common on June 15th, flying over the Moraine (5751 feet), between the Rhone Glacier Hotel and the foot of the Rhone Glacier; the females were scarce. This species is quick on the wing and difficult to capture; it occasionally rested on the few low flowering plants on the Moraine, but had to be approached with great caution. This species seems to be somewhat local, for I only saw one other specimen, in a meadow at Zermatt.

Anthocharis Belia, var. *simplonia*, common, but worn, in the St. Nicolua Valley, middle of June; at a thousand feet higher, however, in the Schmutt Valley, Zermatt, it was in very fine condition. *A. cardamines*, not uncommon at Zermatt in June.

Leucophasia sinapis, Saas Valley, June and August, up to 2800 feet, common.

Colias Phicomone, common, July 27th, in the meadows below Saas Fé Glacier, 6200 feet. *C. Hyale*, generally common in August, up to 4500 feet; very abundant in June.

Gonepteryx rhamni, a few at Stalden in June.

Thecla w-album, a few worn, at rest on *Umbelliferæ* in the Vallée des Ormonts, beginning of August. *T. rubi*, not uncommon, Zermatt, in June.

Polyommatus virgaureæ, var. *zermattensis*, in the greatest abundance at the end of July, Saas-im-Grund; females did not appear in any numbers until males were nearly over. *P. Hippothoë*, var. *Eurybia*, a few worn specimens end of July, Saas-im-Grund; this appears to be rather an early species, for I met with it in June both at Andermatt and Zermatt. *P. Alciphron*, var. *Gordius*, of this lovely species I took five specimens, three at Saas-im-Grund end of July, and two in the St. Nicolaus Valley end of June. *P. Dorilis*, rather common, Vallée des Ormonts, 3000 feet, beginning of August. *P. Phlæas*, Brunnen, common but very worn, 1st June.

Of the "blues" I took nineteen species, viz.:—*Lycæna Ægon*, very abundant, Brunnen, beginning of June. *L. Argus*, in profusion end of July, Saas Valley, up to 7000 feet. *L. Optilete*, a few very worn end of July, Saas Valley. *L. Baton*, one specimen at Stalden in June. *L. Pheretes*, *orbitulus*, and *Eros*, a few worn in the Saas Valley at 5200 feet, end of July; probably they were nearly over at this elevation, for at 7000 feet on the banks of the Mattmark See they were common and fine. *L. Astrarche* (*Agestis*), generally distributed, but never very common, occurring in June and July. *L. Icarus* (*Alexis*), Brunnen and Stalden, fairly common. *L. Eumedon*, common in Saas Valley, middle of June; Mattmark See, end of July. *L. Escheri*, one or two, Stalden, end of June. *L. Bellargus* (*Adonis*), very abundant at Brunnen, beginning of June. *L. Corydon*, common, Saas-im-Grund, end of July. *L. Hylas*, Vallée des Ormonts, 3700 feet, a few in August. *L. Damon*, very common, Vallée des Ormonts, 3000 feet, beginning of August. *L. Donzelii*, of this scarce "blue" I took a series at the end of July along the zig-zag path leading from Saas-im-Grund to Saas Fé. *L. minima* (*Alsus*), very abundant but worn, at Brunnen, beginning of June; very fine, middle of June, at Andermatt, about 3000 feet higher. *L. semiargus* (*Acis*), generally distributed and somewhat common, from 1500 to 5500 feet. *L. Arion*, a few at Brunnen, beginning of June, mostly worn; at higher elevations, viz., at Stalden and Zermatt, the species was represented by the form *obscura*.

Nemeobius Lucina, not uncommon at Brunnen, beginning of June.

Limenitis Camilla, not uncommon in the gardens at Lausanne, middle of July.

Grapta c-album, Hospenthal, 4800 feet, Valley of Usuren, a few also at Stalden in June.

Vanessa urticæ, Andermatt, common in June. *V. Io*, Saas Valley, up to 5000 feet, August; larvæ at Stalden in June. *V. Antiopa*, I was surprised to meet with hibernated specimens of this species so late as the end of June, one at Zermatt and three at Stalden.

Melitæa Cynthia, the pupæ of this species were not uncommon on rocks at about 7000 feet, almost at the summit of the Furca Pass; I only bred two butterflies, ♂ and ♀, the remaining pupæ producing ichneumons; I also found a few of the full grown larvæ. *M. Aurinia* (*Artemis*), common, but worn, in June, at Brunnen, in swampy ground near the Lake of Lucerne. *M. Phœbe*, this fine species was common at Zermatt and Stalden, middle of June. *M. didyma*, one or two in beautiful condition, end of June, Stalden. *M. Dictynna*, common at Brunnen, flying in company with *M. Artemis*; also abundant at Stalden. *M. Athalia*, Stalden, common, middle of June. *M. Parthenie*, Brunnen, a little way up the mountain sides, also at Stalden; common in June.

Argynnis Euphrosyne, only met with at rather high elevations, viz., at Mattmark See and Andermatt. *A. Pales*, a very abundant species up to 7000 feet, in Saas Valley, end of July. At the latter elevation, the variety *Napæa* was not uncommon, I took one beautiful specimen (♀) almost uniformly blue-black. *A. Amathusia*, Diablerets, 3800 feet, end of July, common but worn. *A. Ino*, Diablerets, 3800 feet, end of July, common but worn. *A. Lathonia*, generally distributed and rather common up to about 5000 feet, in July and August; I took several wasted specimens at Zermatt in the middle of June. *A. Niobe* and var. *Eris*, both generally common in Saas Valley up to 6000 feet; at this elevation, at Saas Fé, the species swarmed at one particular spot, where also a very small form occurred not unfrequently. *A. Adippe*, common in the Vallée des Ormonts, August. *A. Paphia*, rather common, Sepey Road, near Aigle.

Melanargia Galatea, very common up to 2800 feet, Saas Valley, June and July.

Of the genus *Erebia* I took sixteen species:—*E. Epiphron*, var. *Nelamus*, a few in company with *E. Melampus*, which was very common and fine at Saas-im-Grund, end of July. *E. Mnestra*, a few from end of July, Saas Valley, 6600 feet. *E. Manto*, common and fine, Diablerets, 5000 feet, August. *E. Ceto*, very common in meadows, Zermatt, middle of June. *E. Medusa* and *Stygne*, at Brunnen, beginning of June. *E. lappona*, end of July, Mattmark See, two almost at the summit of the Furca Pass (at 7500 feet) on June 16th! *E. Evias*, Saas Valley and Zermatt, very common but worn, end of June. *E. glacialis*, this species occurred at about 6900 feet on a moraine immediately below the Mattmark See; there was absolutely not a trace of any vegetation, not even a blade of grass, on the moraine, yet the species was never taken away from it; it flew somewhat slowly, but was difficult to capture, owing to the rough nature of the ground, the specimens were obtained chiefly by waiting for them on the path which crossed the moraine; end of July. *E. Tyndarus*, a most abundant *Erebia* at Saas, end of July; one at Zermatt middle of June. *E. Gorge*, a few, end of July, Mattmark See. *E. Goante*, Saas Valley, up to about 5000 feet, end of July, common. *E. æthiops* (*Blandina*), Vallée des Ormonts, 4800 feet, very abundant, August. *E. Ligea*, a few worn, Vallée des Ormonts, in August. *E. Euryale*, a beautiful series, Zermatt and Stalden, end of June.

Œneis Aëllo, one at Schmutt Valley and two at Stalden, all rather worn, middle of June.

Satyrus Hermione, Stalden, common, end of June and July. *S. cordula*, in the greatest abundance, meadows, Sepey Road, Aïgle.

Pararge Mæra, generally distributed and common up to about 4000 feet; the pretty green pupæ not uncommon under ledges of rocks.

Epinephele Lycaon, common, Saas-im-Grund, end of July. *E. Janira*, common, Saas Valley, up to about 3000 feet, June and July. *E. Hyperanthus*, common, Saas Valley, up to about 3000 feet, June and July.

Cœnonympha Satyrion, common at Saas and Zermatt, June and July. *C. Pamphilus*, common at Zermatt, end of June. *C. Tiphon*, Brunnen, one specimen (very like the Scotch form *Laïdion*) in a swamp near Lake of Lucerne.

Syrichthus carthami, two at Stalden, June. *S. alveus*, very abundant at Saas, end of July. *S. alveus*, var. *serratulæ*, Andermatt, June, very common. *S.* var. *cirsii*, Stalden, one or two. *S. Sao*, Vallée des Ormonts, in August; Brunnen and Andermatt in June, rather scarce. *S. malvæ*, very abundant, 7000 feet, Andermatt.

Nisoniades Tages, generally distributed, 2000 to 4000 feet.

Hesperia lineola, *sylvanus* and *comma*, all rather common at Saas end of July.

Carterocephalus Palæmon (Paniscus), at Brunnen and Andermatt, scarce.

Macroglossa bombyliformis, not uncommon at Brunnen, in swampy places, beginning of June. *M. fuciformis*, common in meadows at Andermatt, up to 5000 feet, middle of June.

Zygæna exulans, very common, Mattmark See, end of July.

Syntomis Phegea, one specimen, Stalden, June.

Setina aurita, very abundant, Saas Valley.

Callimorpha Hera, not uncommon, Stalden, end of July.

Acronycta rumicis, Zermatt, June.

Dianthœcia cæsia, two specimens at rest on rocks, Zermatt, June.

Acidalia ornata, Gœschenen, June.

Nyssia alpinaria, one, Rhone Valley, June.

Gnophos glaucinaria, Gœschenen, June.

Psodos quadrifaria, this pretty species was very abundant, at 6500 feet, at Andermatt, June.

Abraxas marginata, Gœschenen, June.

Cidaria turbata, Hospenthal, June. *C. ruficinctata*, Andermatt, June. *C. incultaria*, common, Andermatt, June. *C. hastata*, Zermatt, June. *C. berberata*, Zermatt, June.

Hercyna holosericalis, very abundant, Andermatt, 6000 feet, June. *H. alpestralis*, Zermatt, June.

Catastia marginea, var. *auricella*, Zermatt, June.

Botys nigralis, Zermatt, June. *B. lutealis*, Zermatt, June. *B. ærealis*, Zermatt, June.

Ancylosis cinnamomella, Zermatt, June.

Sciaphila Colquhounana or *Penziana*, apparently intermediate between two species, Zermatt, June.

Shrublands, Eltham, Kent:
November 17*th*, 1886.

Vanessa c-album.—On April 26th I caught a fine ♀ *V. c-album* flying over some currant bushes, and was fortunate enough to obtain a good many ova, which were all laid between April 27th and May 6th in the bright morning sunshine. The eggs hatched between May 5th and 11th, and the larvæ (fed on currant and nettle mixed) were full grown from June 17th to 23rd. The first butterfly emerged on June 26th, and the last on July 3rd, and all were very fine and of the pale summer variety. Two of the insects paired on June 30th, and the ♀ commenced laying on July 1st and continued doing so until the 10th, when there were 120 ova in all.

Unfortunately a spell of very cold weather began on July 12th, and more than half the eggs perished in consequence. The seven eggs laid last all hatched on July 15th, while a few of the earlier ones hatched at intervals till the 18th. The larvæ were divided, one lot fed on currant the other on nettle. The butterflies emerged from August 17th to 27th; those fed on currant were decidedly finer specimens, but all were considerably paler than the usual form. Several pairs were put together, but no ova were obtained. This beautiful butterfly has been common this year, and wild pupæ were found in July, August, September and October; several larvæ in the two last named months were found in the hop-yards by the pickers, the last butterfly from these appearing on October 27th.—E. Hutchinson, Kimbolton, Leominster: *December*, 1886.

On the flight and pairing of Hepialus hectus and humuli.—My attention was first drawn to this subject by an interesting note by Mr. Barrett (Ent. Mo. Mag., vol. xix, p. 90) on the odour emitted by the male of *H. hectus*. Dr. Chapman's earlier note on *H. humuli* had escaped my attention. Since then I have more than once seen the females of *H. hectus* fly to the males when the latter were oscillating in the manner common to this species and *humuli*, and I have not the least doubt that female *hectus* are attracted by the odour diffused by the males. The males fly pretty steadily backwards and forwards only a few inches above the herbage; the females have a curious tumbling, shuffling sort of flight, quite different to anything else I have seen. They shuffle about right up to the male, and the pair then retire to the herbage below. If boxed before pairing, the males are quiet enough, but the females flutter till they are quite unfit for the cabinet. Unimpregnated females deposit their ova quite readily in a chip box, and, rather to my surprise, I found these ova turn black. I had always thought the change of colour was a sign of fertility, but it is certainly not so with *hectus*.

I have frequently watched the oscillations of male *humuli*, and can confirm Dr. Chapman's observations in every particular. They fly considerably higher above the herbage than do *hectus*, and I had arrived at the same conclusions as he does, viz., that the female sees the male, and that he flies to show himself. If this be so, and I have no doubt about it, it probably accounts for the silvery brightness of the male. The variety *hethlandica* is said to "assume" the markings of the female, but it is much more likely that the sexes were originally alike, rather than that they have subsequently became so. If the female flies to the male by sight, the paler specimens would be better seen in the dusky twilight, and the tendency would be to the production of light coloured males, except in more northern latitudes, where the prolonged daylight would render the colour of less importance, and the production of light coloured males would be a slower process. This theory accounts exactly for the various forms found in more northern latitudes. The difference between the flight of the female when ovipositing, and when seeking a mate, is most marked, and they fly much later in the evening when dropping their ova among the grass.—J. E. Robson, Hartlepool: *December*, 1886.

Mutilation in the process of transformation.—On September 9th, when looking into a box in which were pupæ of *Pterophorus acanthodactylus*, I noticed an imago lying flat on the bottom of the box, and apparently dead; on being touched, however, it showed signs of activity, and began to wriggle away to the best of its power. I then carefully examined it, and found, to my surprise, that, although fairly perfect in other respects, it was absolutely *legless*; nor was the mystery solved until I found the empty pupa case from which the moth had just emerged, and noticed the fractured ends of the six perfectly-formed legs protruding from it. All the legs were broken off near the thorax, at different joints.—Eustace R. Bankes, The Rectory, Corfe Castle: *December 3rd*, 1886.

Arctia mendica.—I would gladly learn if any entomologist who has bred or taken *A. mendica* in Ireland, has found the male differ in colour from the smoky-black form so familiar to English collectors?

In the summer of 1885 a kind correspondent sent me ova of the above species from Cork; they soon hatched, and the larvæ fed up quickly on dock and nettle. They were most voracious, requiring their cage replenished daily; this being neglected one busy day when the larvæ were nearly full fed, they ate their way through the calico, and nearly all escaped. The few larvæ remaining in the cage were taken good care of. Early in last April I received a letter from my kind correspondent telling me the same batch of ova he shared with me were producing him creamy and smoky-*white* males, and he wished to know if mine were coming out the same unusual colour. Mine did not emerge till fully a month later, but when they did so, the males were all creamy or smoky-*white*, and the females had very few spots of black on their wings, and were very different to any English ones I have ever seen. Eggs were obtained, and it is needless to say the larvæ were better taken care of this summer. The result is anxiously looked forward to.—E. S. Hutchinson, Grantsfield, Leominster: *December 13th*, 1886.

On the life-history of Nepticula headleyella, Stn., and of Phyllocnistis saligna, Zell.—The capture in June, 1885, of three specimens of the first brood, and in the following August of eight or nine of the second brood of the above-named pretty *Nepticula*, hitherto so scarce in collections (Ent. Mo. Mag., xxii, 257), gave me some hope of being able to find the larvæ in the autumn. This hope was realized in October. The life-history proved interesting, both on account of the peculiar habit of the larva, and also because, so far as I am aware, no species of *Nepticula* has been previously found to feed on any plant of the Natural Order *Labiatæ*.

The egg seems to be laid on the upper surface of a leaf of *Prunella vulgaris*, generally near the mid-rib. The young larva makes a long and very narrow gallery in the blade of this leaf, often running half-way, or even all round the edge of it, the frass forming a continuous dark central line. After a while, the larva bores down the petiole of the leaf and up that of another, sometimes the opposite one, sometimes one of those at the next node. This leaf, unless buried among long herbage, becomes of a dull purple colour, while the larva is tunnelling up its footstalk, owing, probably, to the interference with its sap-supplies hastening its ripening. Arrived at the blade of this leaf, the larva makes a wide blotch-like mine, often removing a great part, or even the whole of the parenchyma, unless the leaf be a very large one, when the mine takes the form of a broad zigzag gallery. Should the second leaf be very small, a third, or even a fourth, leaf may be mined. The frass forms a broad, broken, dark line in the middle of the mine. The full-fed larva is about two lines long; head very pale brown; body bright yellow; food showing through in the dorsal region as a long, dark green blotch. Cocoon dark brown, mussel-shaped, slightly keeled at larger end, rather flossy. The moths begin to appear at the end of May, and again towards the end of August, while the larvæ may be found at the end of July and beginning of August, and for the second time at the end of September, and almost throughout October.

It is, perhaps, worth noticing that the larva of *Phyllocnistis saligna*, Zell., greatly resembles that of *Nepticula headleyella* in its way of travelling from leaf to leaf. The egg is laid near the mid-rib of a leaf of one of the smooth-leaved willows. The young larva mines the upper-side of the leaf, parallel with the mid-rib, sometimes for nearly its whole length; then bores down the petiole, and down the twig for an inch or more, turns round and mines up the twig for several inches, say, from four to eight, keeping the whole time just under the epidermis, then up the petiole of another leaf, in the under-side of which it makes a gallery of several inches' length before pupating in a little blotch at the edge of the leaf. I may add that the quickest way of finding the larvæ or pupæ is to search for the twigs with the bark mined.—W. H. B. Fletcher, Fairlawn, Worthing: *December* 13*th*, 1886.

Nepticula desperatella, Frey (new to the British List), in Herefordshire.—Last June I bred three specimens of this unicolorous bronzy *Nepticula* from wild apple. Mr. Stainton kindly named it, and furnished me with the following quotation from Frey's Tineen u. Pterophoren der Schweiz, p. 374:—"The rather bright green larva occurs on wild apple trees in October, on quite young bushes, often in prodigious quantities—all the leaves appearing brown from the mines of these larvæ, of which I have found 12 or more in one leaf—though I have bred the insect freely, I have never seen a specimen of the imago at large."

I would add, that here the insect appears to be exclusively a woodland species, and at the same time very local, being confined to one large wood, where, among the older portions of the undergrowth it hunts up its scattered food-plant, following it quite to the boundary fence, and refusing to go further, though wild apple is plentiful enough in the adjoining hedges. The larvæ, which should be looked for from the middle to the end of September, occur in some quantities on the same bush, and are, therefore, easy to find, and would be still more so, had they not a special liking for the small inconspicuous shoots that grow close to the ground. The leaves on these low shoots are so small, or even minute, that they seldom contain more than one larva, and I have not yet seen anything approaching the 12 or more in one leaf that Prof. Frey speaks of. The mine, at first a slender line running usually along the edge of the leaf for some distance, widens into a broad twisting gallery, in which the coils coalesce, and form a sort of false blotch.—JOHN H. WOOD, Tarrington, Ledbury: *December* 15*th*, 1886.

Scottish Coleoptera.—Having authenticated one record in Murray's "*Coleoptera* of Scotland," I must now proceed to relegate two others to the category of delenda. My excuse for not having done this sooner must be, that until within the last three or four years, I have not been working at *Coleoptera* for a long time. Certainly, *Malachius viridis* was never taken by me at Ormiston (p. 57), and the record must have arisen through some misapprehension on Murray's part. Nor did I ever (p. 49) take *Aphodius quadrimaculatus* on the Pentlands, or anywhere else in Scotland. The insects taken on the Pentlands, and which were recorded by Murray as 4-*maculatus*, and mentioned by Hardy in the Catalogue of the Insects of Northumberland and Durham, under the name of *uliginosus*, were *putridus* (*borealis*, Gyll.). I have, however, another of Murray's insects to substantiate as Scottish, viz., *Barypeithes brunnipes*, Ol., which occurs in a meadow in this neighbourhood, and also at Duddingston, where I took it more than thirty years ago. Dr. Sharp says, "I have not seen any individual found in Scotland of the species" (Scot. Nat., vol. v, p. 137).—R. F. LOGAN, Colinton, Midlothian: *December*, 1886.

Scarcity of Wasps.—The abundance of ♀ wasps (*Vespa* species) in the spring, and the scarcity of wasps in the autumn of this year, were both marked circumstances here, and the same facts were so general, that comment on them may be met with in papers and journals that do not usually notice such matters. In May plenty of the suspended nests of those species that build above ground were to be met with, but the weather of May and June were so unfavourable to wasp life by preventing the queen mother from foraging, that a wasp was a rare insect for the rest of the season, nearly all colonies perishing. Hive-bees suffered similarly, and it was not till July that a laying up of stores that should be largely done in May and June could be commenced. At the end of October I met with another illustration of the same conditions. On a bank of earth protected from rain by overhanging turf were the remains of many of the filagree tubes of *Odynerus spinipes.* If the nidification had been completed, portions of these should have been used to stop the mouths of the burrows: I found no burrows so stopped, and on excavating seven burrows I found three of them with only one *spinipes* cocoon at the bottom, and the other four empty. I went no further, not wishing to assist the extinction of an old favourite; I never before met with a *spinipes* colony where things had gone so disastrously.—T. A. CHAPMAN, Hereford: *November* 13*th*, 1886.

Review.

THE STRUCTURE AND LIFE-HISTORY OF THE COCKROACH: AN INTRODUCTION TO THE STUDY OF INSECTS. By Prof. L. C. MIALL and ALFRED DENNY. Pp.

224, with numerous illustrations. London: Lovell Reeve, & Co.; Leeds: R. Jackson. 1886, 8vo.

Those who desire to be initiated into the anatomy and physiology of insects, cannot do better than study this instructive volume; it is clearly written in simple language, and the authors have evidently compared their own observations with the works of others. The Cockroach has always been a favourite insect with students of anatomy and physiology: partly on account of its abundance; partly on account of its form, which presents a broad surface on which to work; partly on account of its singular manner of oviposition; and partly on account of its primitive nature. While the book treats on the Cockroach in particular, it is, at the same time, a treatise on the comparative anatomy of insects in general. Objections might be raised as to certain pet theories being occasionally too strongly advocated, but the other side of the question is usually prominently put forward in such cases. The authors are careful to acknowledge the assistance they have received from Professors Plateau and Nusbaum on certain points they have specially studied, and a very useful chapter is the concluding one by Mr. Scudder, on the "Cockroach of the past:" these insects being amongst the few that have retained their leading characteristics from the earliest Palæozoic times. We recommend this book to the notice of those of our younger entomologists who wish to know something about the *inside* as well as the *outside* of an insect.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY, *Nov. 18th*, 1886: R. ADKIN, Esq., F.E.S., President, in the Chair. Messrs. Blandford and Mullins were elected Members.

Mr. Billups exhibited *Prosopis punctulatissima*, Sm., taken at South Hayling, June, 1886; he also exhibited two drawers of *Ichneumonidæ*, showing a method of mounting and labelling, obviating the keeping of a journal. Mr. South showed varieties of *Lycæna Icarus, bellargus*, and *Corydon*, and remarked on their apparent significance.

December 2nd, 1886.—The President in the Chair. Mr. W. Farren, of Cambridge, was elected a Member.

Mr. Tutt exhibited long series of species of *Agrotis*, and, for comparison, on behalf of Mr. Russ, of Sligo, *A. cursoria*; also *Epunda lutulenta*, Bork., *var. sedi*, Gn., and *var. luneburgensis*, Frr. Mr. Wellman, *Satyrus Semele*, L., and *Lycæna Icarus*, Rott., from Ireland. Mr. Tugwell, insects from New Caledonia. Mr. South, *Lepidoptera* from the Amur Valley. Mr. Adkin, varieties of *Sarothripus undulanus*, Hb., from the New Forest. Dr. P. Rendall, *Noctua festiva*, Hb., *var. conflua*, Tr.; an interesting discussion then took place. Mr. Hall, a specimen of *Locusta viridissima*, found at sugar. Mr. Tugwell stated that this species was often to be found at sugar on the sand-hills at Deal, and he was of opinion it came to catch the insects, as he had seen it catch and devour large moths. Mr. Billups exhibited *Aleurodes vaporariorum*, Westw., from a greenhouse at Snaresbrook, Dec. 2nd, on leaves of Tomato.

The Annual Exhibition was held at the Bridge House Hotel, London Bridge, on November 25th, 1886, and over ninety members and friends were represented. During the evening about 1200 visitors attended. Among those exhibiting insects were:—Mr. McLachlan, Exotic *Neuroptera*, &c.; Mr. J. J. Weir, a series of *Argynnis Paphia*, L., and other *Argynnidæ*, &c.; The Zoological Society, species of *Lepidoptera* reared in the gardens of the Society; Mr. Adkin, British *Pterophori*, *Tortrices*, &c., taken or bred during the year; Mr. W. Farren, *Bryophila impar*, Warren, varieties of *Acidalia rubiginata*, Hufn., &c.; Mr. L. Gibb, *Zygæna exulans*, Hoch., *var. subochracea*, White; Mr. Harwood, a variety of *Arctia villica*, L.; Mr. Murray, *Cidaria reticulata*, Hb.; Mr. South, his almost complete collection of British *Crambidæ*, *Pterophoridæ*, and *Pyralidæ*; Dr. Rendall, British *Vanessa Antiopa*, L., *Laphygma exigua*, &c.; Mr. W. Warren, *Bryophila impar*, Warren, and forms of *B. perla*, Hb.; Mr. Jager, *Callimorpha Hera*, L., *var. lutescens*, Staud.; Mr. Shearwood, preserved larvæ and imagines of *Lepidoptera*; Mr. Wellman, British *Lepidoptera*; Mr. Williams, varieties of *Abraxas grossulariata*, L., &c.; Mr. Adye, *Chœrocampa celerio*, L., interesting varieties of *Epinephele Janira*, L., and *Hemerophila abruptaria*, Thnb.; Mr. Anderson, life-histories of several species of wood-boring larvæ; Mr. Cooper, living *Phorodesma smaragdaria*, Hb., &c.; Mr. Jobson, *P. smaragdaria* and *Erastria venustula*, Hb.; Mr. Elisha, British *Tineina*, the *Coleoptera* being especially noticeable; Mr. Goldthwaite, *Sphinx convolvuli*, L., &c.; Mr. Barclay, *Chœrocampa celerio*, L.; *Pachetra leucophæa*, View., &c.; Mr. Knight, hybrids between *Smerinthus populi*, L., and *S. ocellatus*, L., &c.; Mr. Tugwell, British *Nocturni*, *Macroglossa* to *Setina*; Mr. Tutt, comparative series of species of *Agrotis*, also *Tephrosia crepuscularia*, Hb., and *T. biundularia*, Bork.; Mr. Williams, life-histories of British *Lepidoptera*, and a variety of *Pericallia syringaria*, L.; Mrs. Hutchinson, examples of three broods of *Vanessa c-album*, L., and a doubtful *Eupithecia*; Mr. Smith, a white variety of *Lasiocampa quercifolia*, L., &c.; Mr. Bliss, Exotic *Lepidoptera*; Mr. Sequeira, *Lepidoptera* from Central America; Mr. Edwards, exotic insects; Mr. Billups, British (and exotic) *Coleoptera*, *Hemiptera*, *Hymenoptera-Aculeata*, *Ichneumonidæ*, and *Diptera*; Mr. Grut, exotic *Coleoptera*; Mr. Shaw, some recently captured British *Orthoptera*; Mr. West (Greenwich), British *Coleoptera*; Messrs. Carpenter, Hall, Levett, Ellison, Joy, Watson, Helps, Fremlin, Oldham, Hickling, McDonald, and others contributed.—H. W. BARKER and W. A. PEARCE, *Hon. Secs.*

ENTOMOLOGICAL SOCIETY OF LONDON: *December* 1*st*, 1886. — ROBERT MCLACHLAN, Esq., F.R.S., President, in the Chair.

Mr. W. H. Miskin, of Brisbane, Queensland (formerly a Subscriber), Mr. R. E. Salwey, of Folkestone, and Mr. F. W. Biddle, M.A., of Beckenham, were elected Fellows.

Mr. Howard Vaughan exhibited a long series of *Gnophos obscurata*, comprising specimens from various parts of Ireland, North Wales, Yorkshire, Berwick-on-Tweed, the New Forest, Folkestone, Lewes, and the Surrey hills, to show the variation of the species in connection with the Geological formations of the various localities whence the specimens were obtained.

Dr. Sharp showed a series of drawings of New Zealand *Coleoptera*, by Freiherr von Schlereth, remarkable for their delicacy and accuracy.

Mr. R. Adkin exhibited specimens of *Cidaria reticulata*, recently bred by Mr. H. Murray, of Carnforth, from larvæ collected by him near Windermere, on *Impatiens noli-me-tangere*. Mr. Adkin said that as the food-plant was so extremely local, and, consequently, difficult for Mr. Murray to obtain, he had endeavoured to get the larvæ to feed on some other species of balsam, but had not succeeded in doing so. Mr. E. B. Poulton observed that this statement tended to confirm the remarks he made at a recent meeting of the Society, on the subject of the habits of Lepidopterous larvæ with reference to their food-plants.

Mr. Billups exhibited a number of living specimens of *Aleurodes vaporariorum*, Westw., obtained from a greenhouse at Snaresbrook, where they have caused great havoc amongst tomato-plants (*Lycopersicum esculentum*). He remarked that the species had been first figured and described by Prof. Westwood, in the "Gardener's Chronicle," 1856, and that attention had been recently called to it by Mr. Douglas (Ent. Mo. Mag. for December). Mr. J. Jenner Weir stated that plants in his greenhouse had been attacked by the same species.

Mr. Poulton exhibited the blood of a larva of *Smerinthus tiliæ*, and demonstrated, by means of a micro-spectroscope, the probable existence of chlorophyll therein.

Mr. G. T. Porritt exhibited forms of *Cidaria suffumata* from Huddersfield, including one very similar to that taken at Dover by Mr. Sydney Webb (Proc. Ent. Soc., 1886, p. xxv), and one still more extreme, having only the basal mark and the central stripe, with a slight streak at the tip, brown, the remainder of the wings being perfectly white. He also exhibited a series of small bilberry-fed *Hypsipetes elutata* from Huddersfield, showing green, red-brown, and black forms.

Mr. S. Stevens exhibited forms of *Camptogramma bilineata* and *Emmelesia albulata* from the Shetland Isles, and a curious variety of *Chelonia Caja* from Norwich.

The Secretary read a letter from the Administrator-General of British Guiana, on the subject of the urticating properties possessed by the larvæ and pupæ of certain species of *Lepidoptera* collected in Demerara.

Mr. McLachlan read "A Note concerning certain *Nemopteridæ*."

Miss E. A. Ormerod communicated a paper "On the occurrence of the Hessian Fly (*Cecidomyia destructor*) in Great Britain." It appeared from this paper that there could be no longer any doubt as to the occurrence of the insect in this country, specimens obtained in Hertfordshire having been submitted to, and identified by Prof. Westwood, and by Mr. W. Saunders, of London, Ontario. Prof. Westwood said the specimens agreed exactly with Austrian specimens in his possession. A discussion followed the reading of this paper, in which the President, Mr. C. O. Waterhouse, Mr. Theodore Wood and others took part.

At the close of the Ordinary Meeting a Special Meeting was held for the purpose of considering certain proposed alterations in the Bye-Laws. The proposed alterations having been explained to the Meeting, were, after some discussion, agreed to, and the proceedings terminated.—H. Goss, *Secretary*.

HYMENOPTEROLOGICAL NOTES.

BY P. CAMERON, F.E.S.

I.—ON SOME NEW OR LITTLE-KNOWN BRITISH *HYMENOPTERA*.

NEMATUS OBLONGUS, Cam.

I believe this is *N. laricis*, Htg. The species varies not a little in form and coloration; and apparently, also, in the length of the antennæ. The form *oblongus* has the body shorter and broader than any of the continental specimens I have seen of *laricis*. I am not sure if the ♂ I have allotted to *oblongus* is really the ♂; Zaddach is the only author who describes the ♂ of *laricis*. All that he says about it is that the antennæ are laterally compressed and yellowish-brown beneath, and that the stigma is yellowish-brown.

The larva of *N. laricis* feeds on *Abies larix*.

NEMATUS PALLIPES, Fallén, *sec.* Thoms.

= *N. carinatus*, Htg., *sec.* Zad.

I am indebted to Mr. G. C. Champion for a specimen of this species taken by him at Aviemore, Inverness-shire. It comes nearest to *N. astutus* and *N. lativentris*, but differs from both in the legs and stigma being yellowish-testaceous; the hind femora are only slightly lined with black, and, in particular, the middle lobe of the mesonotum is U-shaped at the apex, not V-shaped as in the other species. *N. breadalbanensis*, Cam., is a narrower species than it; has the antennæ longer and thinner, the abdomen is longer, the femora and coxæ are broadly black, the rest of the legs whitish, not reddish-testaceous, the spurs are shorter, and the transverse basal nervure is recurved nearer the middle of the cellule. The keel on the mesonotum is indistinct, and there is also an indistinct keel on the scutellum in my example of *pallipes*. The third cubital cellule is longer and more dilated at the apex than is *astutus*, and the wings are of a much more decided fulvous tint.

NEMATUS FAGI, Zad.

Schr. Ges. König., xvi, p. 295, taf. 5, f. 1.

On a beech hedge near my house here I found last July four larvæ of this species, and have succeeded in rearing three females from them. The imago does not appear to be distinguishable with any degree of certainty from *N. croceus*; but, as the larvæ are totally different, there can be no doubt of the two species being quite distinct.

NEMATUS LARICIVORUS, Zad.

Schr. Ges. König., xxiv, p. 147, taf. 1, f. 1c.

Black; the labrum, palpi, tegulæ, the pronotum at the tegulæ and legs, white; the coxæ broadly at the base, the four anterior femora at the base, the posterior almost wholly, the apex of the hind tibiæ and the hind tarsi entirely, black; the orbits in front narrowly brownish, the antennæ fulvous, blackish on the upper-side. Wings hyaline; the costa and stigma yellowish-testaceous, the costa palest at the base, the stigma inclining to fuscous at the base. Antennæ as long as the thorax and abdomen united, densely pilose; slightly compressed; the 3—5 joints sub-equal. Head covered with short greyish pile, distinctly punctured; frontal area obsolete; clypeus transverse. Thorax shortly pilose, opaque and punctured above; a fine keel down the middle lobe of the mesonotum; cenchri large, pallid. Abdomen shining, finely shagreened; the last segment above with a Λ-shaped impression in the centre, enclosing a raised, somewhat pear-shaped, part. Cenchri longish. Legs covered with white pile; claws apparently simple. The first cubital nervure is faint, the third cubital cellule a little wider than long, the second transverse cubital nervure received about its own length in front of it, transverse basal nervure received a little in front of the middle of the cellule; the second cubital cellule has a horny point.

The ♀, according to Zaddach, has the antennæ black, the coxæ only black at the base, and the femora are less strongly marked with black. Length, 7 mm.

The femora want the reddish tinge so conspicuous on the femora of *appendiculatus*; the vertex and front are much more strongly punctured, as is also the mesonotum; the hind tarsi are entirely black, and the apex of the hind tibiæ is more distinctly and uniformly so; the third cubital cellule is shorter, and is not dilated at the apex, and the pubescence is darker.

Hab.: Plymouth (C. G. Bignell).

ÆGILIPS BICOLORATA, *sp. n.*

Black; the antennæ brownish beneath, striated, longer than the body; the legs reddish-testaceous, the coxæ blackish, claws fuscous. Wings hyaline, faintly smoky from the radial cellule. Thorax semi-opaque, the mesonotum finely transversely, the pronotum more strongly obliquely, striated; mesopleuræ shining, impunctate; scutellum conical, in front rugosely reticulated, behind shining, faintly punctured; metathorax rugose, the metanotum three-keeled, the middle one not reaching to the top. Petiole rugose, longer than broad. Parapsidal furrows faint, narrow, shallow. Abdomen shining. Radial cellule not much longer than broad. ♂.

Length, 2·5 mm.

Most nearly related so *Æ. striolata*, Cam.; differing from it in the semi-opaque mesonotum, much narrower and shallower parapsidal furrows, by the mesonotum not having a furrow in the centre at the base, in the scutellar foveæ being much longer and deeper, in the scutellum being blunter and broader at the apex, in the rugose metathorax, in the reddish coloured legs, and by the radial cellule being shorter.

Probably from the London district.

II.—PARTHENOGENESIS IN *ERIOCAMPA ANNULIPES.*

During the past summer and autumn the larvæ of *Eriocampa annulipes* have been excessively abundant on some of the beech and hawthorn hedges round Sale; and have proved very destructive to them by eating the epidermis of the leaves. In one place in particular the leaves have had almost every particle of epidermis taken off, thus causing them to become curled up, and useless so far as being able to afford nourishment to the plant. Being so common, I thought that I would experiment to see if the species was parthenogenetic, like *E. ovata*, &c. I find that it is so, having bred males from virgin females.

Eriocampa annulipes has a wider range of food plants than any of the other species. It feeds on willows, birch, oak, lime, beech, and hawthorn.

III.—NOTE ON THE *HYMENOPTERA* OF THE HAWAIIAN ISLANDS.

I regret that, owing to my copy of De Saussure's "Etudes sur l. fam. d. Vespides" wanting some leaves (a fact I have only recently discovered), I have omitted in the paper by Mr. Blackburn and myself ("Memoirs of the Lit. and Phil. Soc. of Manchester," 1886) reference to two species of *Odynerus* described in that work (vol. iii, p. 289), namely, *O. nautarum* and *O. sandwichensis.* The former, I think, is identical with *O. insulicola*; the latter certainly = *O. rubritinctus*, Smith. The species described by De Saussure are in the British Museum.

I wish also to point out that *Tapinoma melanocephalum* is found in Australia, as well as in South America, *l. c.* p. 234.

Sale, Cheshire:
Nov. 15*th*, 1886.

LEPIDOPTERA ON CANNOCK CHASE.

BY CHAS. G. BARRETT, F.E.S.

I had the good fortune this year to spend the month of June in Staffordshire, and as my evenings were at my own disposal, it will readily be supposed that the fine wild district of Cannock Chase was not neglected.

For three weeks the wind was almost constantly cold, and sometimes very strong, and this *appeared* to be a great hardship, but in reality was almost an advantage, for although moths emerged slowly, they were hardy species, and *did* emerge, and were compelled to shelter from the searching wind on the trunks of the trees, where it was easy to find them. When the weather changed, and became hot, collecting was decidedly more difficult and less productive.

A charming sight on the trunk of a large birch was a fine and perfect pair of *Leiocampa dictæoides*, and to a southener an occasional *Hadena glauca* was almost as interesting. I think that Cannock Chase must be nearly the southern limit of this species, it was far from common. Pretty reddish specimens of *Hadena contigua* also occurred, with *Acronycta leporina*, and, much more commonly, *A. rumicis*, pretty specimens with very black markings. The birch trunks swarmed with *Eudorea ambigualis*—the largest I ever saw alive: as large, in fact, as *E. cembræ*—and these also were in many cases dark and strongly marked. *Eupœcilia nana*, which was also plentiful, had an odd trick of sitting on some projecting corner of the rough bark, where it looked precisely like a small bit of bird's dropping. The resemblance of *Halonota Pflugiana* to a larger deposit of the same material was strikingly exemplified in a specimen which had been driven by the rough wind to settle on an alder trunk. I did not suspect that it was an insect, but, puzzled by the straight sharp outline of the dorsal blotch, looked closer, and the supposed bit of bird's dung flew into my face.

The dead—but still standing—birches were infested with *Tinea fulvimitrella* and *cloacella*, the former evidently feeding under the bark, either on the rotten wood or the mycelia of fungi, to a considerable height, the latter usually close to the ground. The large, agaric-shaped, *Polypori*, which grew on these trees (and which probably bore a large share in their destruction), were not infested with any Lepidopterous larvæ, but the pupa skins of both these species of *Tinea* projected from the bark of the trees where other, smaller, fungi were growing. I have seldom seen more lovely insects than some of these *fulvimitrella*, just emerged, nestling in the chinks of the bark to avoid the wind, and prevented by the cold from taking off the gloss of their pristine beauty.

Three or four times I found, also on birches, a single specimen of *Œcophora stipella*, which also must here reach its most southern limit. The specimens were on living and dead trees, and so scarce that no conclusion could be formed as to their food and habits. The noble oaks which abounded along the crests of the hills produced very little. *Cidaria corylata* occurred on their trunks as well as on those of birches, and were of large size and great beauty of colour and markings. One grand oak had been split into three great fragments by lightning, one portion was still standing and in full vigour of life, another lay at full length like a fallen tree of considerable size, rather than a branch, and the third, falling in another direction, had split and half crushed a smaller oak near it. At the edge of the split in the trunk of this smaller oak I found a fine specimen of the curious form of *corylata*, in which the central band is wanting. The vast limb which had fallen on this tree was the resort of numbers of *Eupithecia castigata*, some of them very dark and curious, and *Capua ochraceana* was more than usually common about it, while the other great fallen limb already mentioned, which had not only been struck down, but actually *burnt out* by the lightning, seemed to be a favourite resting place for *Geometræ*, and even *Hadena contigua.* In its degree this old tree looked almost as massive a ruin as many an old castle, and the abundance of insect life under its protection was very curious. From another large oak trunk I obtained a very large specimen of *Cidaria russata*, which was nearly black. Extraordinary to relate, this species was *very scarce*, I only saw one other specimen.

Among *Vaccinium myrtillus* under the trees *Phoxopteryx myrtillana* abounded, very pretty and rather variable, and for numbers, amazing! Early in the month, *Incurvaria masculella* also occurred, though not very commonly, among the *Vaccinium.* Its presence there was perplexing, there certainly being no hawthorn near.* Equally curious was the occurrence, on the hill tops, of *Thecla rubi*, flitting about the *Vaccinium*, sucking the flowers, and resting on the leaves when the sun was obscured. (This was an error in judgment, for the green of its under-side did not match that of the *Vaccinium*, and the little butterfly became thereby conspicuous.) No broom or *Genista* was to be found anywhere near, nor any plant on which it could reasonably be supposed to feed in the larva state. In *very* sheltered places *Nepticula myrtillella* was sometimes to be found, and among the heather *Pleurota bicostella*, sometimes very large, and, at the end of the month, rather abundant.

In the fir woods *Fidonia piniaria* was, of course, abundant, and interesting from the intermixture there, as in Derbyshire, of the southern cream-coloured males and orange females, with the white males and brown females of the north. On the alders in the swampy valleys well marked varieties of *Hypsipetes impluviata* and *Melanippe subtristata* were to be found, and on one occasion a most beautiful black variety of *Cymatophora duplaris* fell from a branch of one of these trees in response to the beating stick. *Eupisteria heparata* also flew among them or settled on the ground, and *Adela Sulzella* and *Degeerella*, *Argyrolepia cnicana*, and the red form of *Eulia ministrana* occasionally occurred. *Hepialus velleda* must have been common to judge by the wings dropped by the bats and lying on the ground, but I could not stay late enough on any evening to see them—trains not permitting. One day, however, the wind was so furious that *velleda* was fairly compelled to shelter in the spacious chambers formed by the spreading roots of large beeches, a tolerably eloquent tribute to the force of the wind.

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* I have found *Incurvaria* cases commonly amongst *Vaccinium myrtillus* at Pitlochry, but did not know to which of the species they belonged.—H. T. S.

On the last visit to the Chase I experienced a disappointment. I was proceeding in the early dusk over one of the barest hills towards the station, when I noticed some small moths flying among tufts of *Nardus stricta* and other wiry grasses, but not being able to see very well, took them for *Gelechia terrella*. To make sure, however, I boxed *one* specimen, and found it to be *Gelechia politella*.

King's Lynn, Norfolk :
August 17*th*, 1886.

THE *LEPIDOPTERA* OF THE BIRMINGHAM DISTRICT.

BY W. G. BLATCH.

In the November (1886) number of the Ent. Mo. Mag. appeared a contribution by W. Harcourt Bath, entitled, "Notes on the *Lepidoptera* of the Birmingham District: a Retrospect."

Mr. Bath's leading idea seems to be that great changes are rapidly taking place in the forms and distribution of plants and insects in the Midlands, and that the Birmingham district offers a specially favourable field to the student of nature, inasmuch as he can there see clear and numerous signs of the extinction of certain species, and their replacement by others. If this were true, it would indeed be an interesting fact, and every true naturalist would eagerly turn his attention to a locality in which such peculiar conditions were so strongly marked.

But what is the character of the evidence adduced by Mr. Bath in support of his contention? With the single exception of *Lycæna semiargus* (which formerly occurred in the district, and now seems to have disappeared), there is not a particle of reliable confirmatory evidence in the long array of "examples" he gives in illustration of his argument.

It would occupy too much space to deal with all the details of the paper in question, and I fancy many of them will not be thought to require notice. Such changes in the fauna and flora as he refers to are not peculiar to the Birmingham district, and are certainly in some cases more imaginary than real. All species are liable to fluctuation, some more than others, abundant one season, scarce another; but these variations are well known and pretty fully recorded. In his introductory matter, Mr. Bath takes a great deal of trouble to prove what every entomologist already knows, and one might feel amused by his laboured paragraphs were it not for his servility to one small word by means of which he rings the "changes" *ad nauseam.* It would be interesting to learn from Mr. Bath what "lists of fifty years ago" he refers to, and in what respect they differ materially from the lists of to-day. Bricks and mortar have, indeed, crowded out a few things from the limited areas affected, but surely it is unfair to attribute this to climatic changes, and the gradual conversion of the forms of one geological period into those of another!

Will Mr. Bath be good enough to disclose his authority for the statement that "not many years ago *Papilio Machaon* used to roam throughout the Midlands?" Would he be surprised to learn that *Apatura Iris* still occurs in several woods in Warwickshire? And will he pardon me for informing him that the "pabulum" of the Purple Emperor larva is not "oak," but "sallow?"* I am glad to say that *Melanargia Galatea* still occurs near Knowle, and is abundant at Salford Priors, Henley in Arden, and in other parts of Warwickshire and Worcestershire.

The mention of *Lycæna Corydon* is very unhappy: there is, indeed, a record of this butterfly having been on one occasion taken at Knowle, but, even if the fact were indisputable, no one except Mr. Bath would jump to the conclusion that the specimen was a natural product of the district. *Argynnis Dia*, and other favourites of Mr. Weaver, must be put down in the same category, and we shall require clearer evidence of their claim to be considered natives of the locality —and, indeed, of their alleged capture in it—before we can accept the story. From what I can gather, it would be rash and indiscreet to a degree to pin one's entomological faith to "that energetic collector, the late Mr. Weaver."

It may be true that "the three large Fritillaries—*Argynnis Aglaia*, *A. Paphia*, and *A. Adippe*—used to occur not uncommonly in Sutton Park about thirty or forty years ago," and that they now appear to be extinct or nearly so, but they are plentiful in other parts of the Birmingham district, and their absence from one small spot does not, it seems to me, affect the general question. As to the common blue, *Lycæna Icarus*, being extinct, or even scarce, in Sutton Park, that is sheer nonsense: I see it there every season, and only last June I captured a fine series in that identical locality, for the purpose of renewing my sets.

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* Corrected on the cover of the December No.—Eds.

Lycæna Argiolus is not confined to Sutton Park, as Mr. Bath declares it to be: it still occurs at Bromsgrove Lickey, Coventry, and some other places near Birmingham.

Gonopteryx rhamni has not yet forsaken Sutton Park, and is not likely to do so I should say, judging from the number of larvæ I saw there during last season feeding on the Buckthorn (*Rhamnus frangula*), which is plentiful in most of the woods. *Vanessa Io*, *Pararge Megæra*, *Epinephele Janira*, &c., are likewise neither extinct nor rare in the same locality, nor, indeed, in any other part of the Birmingham district, as I can vouch from personal observation. *Saturnia pavonia* still flies at Sutton, and the larvæ may be found by any one who takes the trouble to hunt it up at the proper season: it may not occur in equal abundance every year, but that is all that can be truthfully said about it. *Colias Edusa* and *C. Hyale* are never more than casual visitors here, and do not occur more frequently now than in former years. The history of their appearance is in no way connected with local conditions, and, however glad we may feel when they deign to come amongst us, we cannot regard them otherwise than as erratic strangers.

Notwithstanding Mr. Bath's statement, I must say, as a local entomologist of nearly twenty years' standing, that I know of no evidence that would lead me to believe that *Acherontia Atropos* and *Acronycta alni* are less rare in this district at the present time than formerly.

The fluctuations in the appearance of *Vanessa cardui*, *Plusia gamma*, &c., are, I fancy, not unknown to observers, and it seems odd to drag these species in as evidence of great changes going on in the district.

If Mr. Bath will become a student of entomology, on the lines he himself lays down in his concluding sentences, he will probably be more accurate and logical in his next contribution.

214, Green Lane, Smallheath,
Birmingham:
December, 1886.

[Mr. Bath's paper, when accepted, was supposed to be a retrospect of *his own experiences*.—Eds.]

ON THE CASES, &c., OF *OXYETHIRA COSTALIS*, CURT., AND ANOTHER OF THE *HYDROPTILIDÆ*.

BY KENNETH J. MORTON.

At page 17 of the present volume, Mr. McLachlan has recorded the breeding of *Oxyethira costalis*, Curt., and in a few words sketched the more salient characters of its interesting case. He then suggested that I should give further details from materials which he had kindly sent me on more than one occasion. I shall endeavour to do so now; and I take the present opportunity to call attention to another Hydroptilid case communicated by him, which, I believe, also came originally from Mr. Bolton, of Birmingham.

The transparency of the case of *O. costalis* has been noticed. It is so perfectly hyaline, that sometimes the larva appears as if crawling about without any case at all, until suddenly some change of position brings it into view, but this colourless transparency becomes slightly lessened with age, as extraneous matter gets attached to the sides. Speaking broadly, the case may be called wedge-shaped, or triangular in contour. In the place of what would be the extreme thin end of the wedge there is a circular opening with everted margin, the mouth-end of the case; this part is apparently of firm consistency, and firm seams run along the two sides of the triangle. From the mouth backwards the walls become more and more compressed, until towards the posterior end they meet, and apparently unite in the middle, but remain open at either side in a valve-like slit. This curious structure appears to be altogether composed of the larva's silken secretion; when seen with a ¼-inch objective, multitudes of small oval bodies (diatoms) are found to be present, but I am uncertain whether these are actually incorporated with the substance of the case, or simply casually adherent to its outer and inner surfaces. The length is 2½ mm.; breadth at tail end 1½ mm.; this example is not quite of full size.

The larva carries the case with the flat posterior end perpendicular to the surface over which it is moving. It spins web freely, and soon fills a small vessel full of fine threads, along which it wanders about. The head of the larva is rather large in proportion to the size of the three transverse chitinous thoracic segments, and is provided with well developed antennæ; the two posterior pairs of legs are long, with very long and slender tarsal claws; and the body is of the usual obese Hydroptilid form.

Fritz Müller's description of the case of *Lagenopsyche*, a Brazilian genus, agrees so well with that of *O. costalis*, that I quote part of what he says:—"An approximate idea of the case may be formed by imagining the bottom of a bottle to be cut away, and then its under part to be compressed until the opposite sides touch each other, thus transforming the wide circular opening into a narrow slit. The mouth of the bottle represents the mouth-end of the larval case, and the long narrow slit at the tail-end is held in an upright position. * * For transformation the case is placed on one of its broad sides, and then fixed on either side of each end by petiolated discs. * * After having fixed its case, the larva turns its head towards the broader end of it, so that the mouth-end of the larval case becomes the tail-end of the pupa case."*

Unfortunately, my larvæ of *O. costalis* all died before they spun up. I do not doubt, however, that the change of position above indicated takes place, and the case is known to be fixed in the same way (*vide ante*, p. 17).

I am indebted to Mr. McLachlan for bringing before me a paper (with a plate) by Mr. G. V. Hudson on the transformations of a New Zealand species of *Hydroptilidæ*.† The larva and case bear some resemblance to those of *O. costalis*, but the case has a decided shoulder, and there is no everted rim. No mention is made of how the case is carried; the figure suggests that it is trailed on the flat surface. The alteration in position when the nymph stage is reached is noticed, as well as the spinning of an arch-shaped partition towards the broad end.

The second form of case to which I referred may belong to *Orthotrichia angustella*. I bred the insect, but the last ecdysis was not quite complete, and the difficulty of an exact determination was enhanced by the specimen being a ♀. While this case does not share the transparency of that of *O. costalis*, or even that of *Agraylea*, it is not opaque; the colour is greenish, the middle of the back mixed with brownish matter. Form tubular; ventral surface plane, dorsal gently arched; at either end (when viewed dorsally or ventrally) a large triangular excision is seen, and this is unquestionably the strong character of the case; the apices of the triangles are connected by a suture-like line, and the brownish dorsal part has a striated appearance. When about to change, the larva fills up the triangles, produces the sides into concave plates, and closes with silk.

Head and thoracic segments of larva chitinous, narrow, of about equal breadth; head elongate-oval; prothorax almost quadrate; next

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* Trans. Ent. Soc. London, 1879, p. 142. † Trans. N. Z. Institute, vol. xviii, pp. 213–4.

two segments transverse, metathorax rounded posteriorly. These segments are all yellowish, the thoracic segments margined with black. Legs, first pair short, others of moderate and about equal length. Abdomen with first segment narrow, the rest of body very stout, green. This larva has prominent antennæ, and the eyes appear to be larger than usual.

I hope the question as to the maker of this case will soon be set at rest.

At present our knowledge of the cases of European *Hydroptilidæ* appears to be limited to the following, viz.: the three forms mentioned by Pictet (which require further elucidation); *Stactobia* (Mon. Rev. Eur. Trichop., p. 516); *Agraylea*, *Oxyethira*, and *Orthotrichia* (?).*

Carluke, N.B.:
November, 1886.

DESCRIPTIONS OF FOUR NEW SPECIES OF *LYCÆNIDÆ*.

BY HAMILTON H. DRUCE, F.E.S.

JAMIDES PETUNIA, *n. sp.*

♂. *Upper-side.*—Allied to *J. Woodfordii*, but differs in that the wings are a glossy slate-green colour, instead of ultramarine blue.

Under-side: markings as in *J. Woodfordii*, but the whitish lines not nearly so distinct.

The black margins on upper-side are about intermediate between *J. Woodfordii* and *J. campanulata*.

Expanse, as *J. Woodfordii*. *Hab.:* Fiji Islands; Mus. Druce.

This species is interesting as being the only one of the colour in the group. The four specimens I have seen do not vary in colour.

NACADUBA DEXAMENE, *n. sp.*

♂. *Upper-side:* primaries and secondaries dull violet-blue, with distinctly lighter coloured margins, cilia light brown.

Under-side brownish-grey, with darker markings edged with white. Primaries with several dots along the costal margin, an oval spot in the middle of the cell, and a spot curved outwards at the end, beyond which (also curved outwards) is an irregular band of spots, terminating at the lower median nervule, thus leaving a considerable space without a mark, and beyond this a marginal row of inwardly curved lunules. Secondaries with several irregular markings beyond the base, and beyond these a band of broken markings running parallel with a marginal row of triangular lunules, the two anal lunules with distinct black centres.

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* A short note by me on a larva and case, which, probably, belong to what we know as *Hydroptila sparsa*, appeared in this Magazine, vol. iv, p. 17 (June, 1867). The larvæ made opaque oval flattened cases, and concealed themselves in the crevices of stones at the bottom of the stream; I remarked that they were able to suspend themselves by a thread in the water, after the manner of Lepidopterous larvæ in the air. —R. McLachlan.

♀. *Upper-side:* primaries dull greyish-brown, with the base suffused with light blue. Secondaries a somewhat lighter colour than primaries, with a few bluish hairs near base.

Under-side, as in ♂, but ground-colour lighter. Thorax, abdomen, and legs blackish; antennæ black, with white rings; palpi greyish and black tips.

Expanse, $\frac{9}{10}$ in.—$1\frac{1}{5}$ in. *Hab.:* Delagoa Bay, E. Africa (Mrs. Monteiro).

There is a species in the B. Museum unnamed, closely allied, from Lake Nyassa.

NACADUBA GEMMATA, *n. sp.*

♂. *Upper-side:* primaries and secondaries a uniform, dull greyish, silky blue, very narrowly and evenly bordered with brown; cilia greyish.

Under-side greyish-brown, with irregular transverse bands bordered with greyish-white, both wings suffused with black at base. Primaries with a band from the costal nervure to the inner margin, running through the middle of the cell (which band is continued across the secondaries to about the middle of the inner margin); a large oblong spot at the end of the cell, and beyond, at about half the distance between the spot and the posterior margin, runs, curved outwards, a distinct irregular band from the costa to just beyond the middle of the inner margin, and beyond that a marginal row of elongated lunules, curved inwards. Secondaries with three distinct irregular bands, the 1st as referred to above, the 2nd and 3rd at about equal distances from themselves and the 1st, commencing at the costa, running into one beyond the middle, and reaching the inner margin; next a zigzag line, and beyond, commencing at the apex, a row of three indistinct brown dots, followed by two large, orange-bordered, silvery-green ocelli, with black centres, and a silvery-green spot at anal angle. There are no tails to this species.

♀. *Upper-side:* primaries greyish-brown, suffused with glossy sky-blue from base to just beyond the cell. Secondaries greyish-brown, with a dark spot on the posterior margin near the anal angle.

Under-side, same as ♂, except that bases are not suffused with black. Head, thorax, palpi, and legs blackish. Antennæ black, ringed with white.

Expanse, ♂, $\frac{4}{5}$—1 in.; ♀, $\frac{7}{10}$—$\frac{9}{10}$ in. *Hab.:* Fiji Islands; Mus. Druce and B. M.

This species is remarkable for the size of the ocelli on hind-wing below, and is not closely allied to any known to me. Among some dozen specimens before me there is no variation except in size.

DEUDORIX ODANA, *n. sp.*

♂. *Upper-side:* both wings a uniform dark purple-brown, excepting the anal margin, which is brownish; cilia of fore-wing brown, of hind-wing white, except the apex, which is brownish; the lobe is black, thickly speckled with silvery-green scales, bordered outwardly with dark copper. Thorax and abdomen greenish-brown.

Under-side greenish-brown, with an oblong spot—bordered with white—at the end of the cell, and a transverse band curved outwards beyond; there is also a faint greyish line along the outer margin. Secondaries marked as in *D. Galathea*, excepting that the transverse band is far more irregular and not so distinct. Antennæ white, ringed with black and white tips beneath; legs white, palpi white with black tips.

Expanse, $1\frac{2}{5}$ in. *Hab.*: Cameroon Mts., W. Africa (Fuller); Mus. Druce.

This species, although allied to *D. Galathea*, may be at once distinguished by the entire absence of red on the posterior margin of upper-side of secondaries. When held in some lights, both wings are suffused with brilliant blue, which closely resembles some species of *Thaumantis*.

London: *January*, 1887.

LIST OF BRITISH *TIPULIDÆ*, &c. ("DADDY-LONGLEGS"), WITH NOTES.

BY G. H. VERRALL, F.E.S.

(*Continued from page* 160).

Rhamphidia longirostris, Mg.: I expect there has been only one European species described under the three names of *R. longirostris*, *inornata*, and *flava*; Walker sinks *flava* as a synonym of *inornata* in his "Notes on *Diptera*" (1874). I took it freely at Lymington in June, 1885, and a few this year near Tunbridge Wells.

Orimarga virgo, Ztt.: this important addition to the British list occurred on a little grassy slope against the river Torrigill at Inchnadamph in Sutherland, on July 20th & 21st last. It is a very remarkable *Mantis*-like species, exceedingly frail and feeble, and very slow in its movements. I think it must be *O. virgo*, Zetterstedt, Dipt. Skan., x, 3896, though in one ♀ the base of the cubital and the cross vein below are not in a line, and in all the specimens the small cross vein joins the stem of the discal even more before the first fork than in *O. anomala*, Mik., Wien., ent. Zeit., ii, 198, still the large cross vein is after the middle of the discal cell, and the tips of the femora and tibiæ are determinately dark.

Antocha opalizans, O.-S.: in very great abundance in the valley of the Shin last July.

MOLOPHILUS.

1 (8) More or less ochreous, alar expanse, 9 – 12 mm.
2 (7) Yellowish-ochreous, abdomen mostly ochreous.
3 (4) Gen. ♂ with four long thin black processes ....*appendiculatus*, Stæg.
4 (3) Gen. ♂ with two short black processes, or none.

5 (6) Gen. ♂ with broad upper lamellæ, blunt at upper outer angle, and bearing a hook at lower angle ; beneath gen. two shortish black processes... *propinquus*, Egger.
6 (5) Gen. ♂ with upper lamellæ narrowish, and armed at upper outer angle with a small hook, no black processes beneath .... *ochraceus*, Mg.
7 (2) Brownish-ochreous ; gen. ♂ with two very long sickle-shaped black processes ....*bifilatus*, Ver.
8 (1) Black to blackish-brown or grey, alar expanse, 6 mm. or less.
9 (12) Knob of halteres whitish.
10 (11) Deep black species ; wings of male abbreviated .... *ater*, Mg.
11 (10) Blackish-grey species ....*obscurus*, Mg.
12 (9) Knob of halteres blackish ....*murinus*, Mg.

The species of the first group are very similar, and difficult to distinguish, except by the male appendages ; there are, however, minute distinctions which may be of assistance in determining them : I am also not very certain about their nomenclature.

M. ochraceus, Mg. : by this name I recognise a yellow species of which the upper lamella of the male genitalia is very long and simple, rather narrow, and bearing minute black hooks at the end ; there seems to be no lower lamella, but a long yellow middle piece ; the frons is yellow, with a brownish dash on the middle ; the joints of the antennæ are roundish ; the wings are yellow. To me it is the rarest of the four species, but I have stray specimens from Penzance, Lyndhurst, and Wicken.

M. appendiculatus, Stæg. : if I have only one species under this, I am quite satisfied that it is correctly named ; the upper lamellæ of the male genitalia are small, and bear at the upper inner angle a longish process, and at the lower inner angle one pair of short black hooks ; there is a long narrow process below shorter than in the following species ; the lower lamellæ seem large, and bear at the end a very long, curved, thin, black hook below, between the two long black sickle-shaped processes, thus there appear to be four nearly equal long black processes ; it is the yellowest and smallest of all the species, the frons is yellow and the abdomen scarcely at all obscure above ; the wings are yellow. I have it from numerous localities in Devon, Hants, Sussex, Kent, Suffolk, Cambridge, and Sutherland.

M. propinquus, Egger : under this name I place a reddish-yellow species, with the abdomen obscure above ; the upper lamellæ of the male genitalia are broad and blunt, almost square, at their upper inner angles a little produced towards each other so as usually to touch there, at their lower inner angles are short black-pointed hooks, close to these hooks but more inward and more concealed are two more black hooks, and beneath the lamellæ are two longish, black, thin, sickle-shaped processes (not nearly so long as in *M. bifilatus*); lower lamellæ long and narrow; antennæ all yellowish, joints oval, verticils short; frons blackish-grey, wings smoky-yellowish. This species is common, and I have taken it in Hants, Sussex, Kent, Cambridge, Isle of Arran, and at Loch Maree.

M. bifilatus, Ver.: since I described this in last February's number of this Magazine (vol. xxii, p. 199), I have frequently met with it, and am somewhat more suspicious that it may be Meigen's *M. griseus*, as it is much less ochreous than the others, it is also decidedly the largest. I have only caught it in Hants, Cambridge, and Suffolk (my own garden), but believe it is quite common.

RHYPHOLOPHUS.

1 (6) Last vein straight, short; joints of male antennæ petiolate.
2 (5) Brownish-grey.
3 (4) Thorax with a central dark line ....*lineatus*, Mg.
4 (3) Thorax not striped...*nodulosus*, Mcq.
5 (2) Ochreous ....*similis*, Stæg.
6 (1) Last vein sinuated, long; joints of male antennæ ovate.
7 (8) Thorax with four tolerably distinct stripes, the middle two uniting behind; wings considerably mottled ... .*varius*, Mg.
8 (7) Thorax indistinctly striped; wings less mottled ......*hæmorrhoidalis*, Ztt.

Three of the above species I added to our lists last January, and I took them again last summer; *R. varius* was abundant at Princetown, Dartmoor, and *R. similis* I met with rarely near Inverness and Inveran, it is a pretty, very distinct species.

This genus requires considerably more study; we have certainly two common species under *R. nodulosus*, but which is Macquart's species I do not know; then there is the species I mentioned last February which Mr. Cooke sent me as *Erioptera varia*, but which has the last vein straight and short; and on June 4th, 1886, I caught at Frant one female of a large species with a discal cell, probably *R. pentagonalis* of Loew, but I could not find more, though I closely searched.

ERIOPTERA.

The six species in my list divide themselves into two groups, the first four being wholly or largely ochreous, while the last two are greyish or blackish; of the ochreous species *E. macrophthalma*, Lw., now first recorded as British, is a large yellow species with *black* palpi and large eyes, its abdomen is longer and narrower than that of

E. flavescens, L., the knobs of the halteres are dark brown above, the tarsi, especially the hindmost, whitish-yellow, and the male genitalia with yellow hooks only a little tinged with brown. It was not at all uncommon last June near Tunbridge Wells, but I unfortunately did not then suspect its being distinct from *E. flavescens*, L. Loew described it in 1871 from Silesia, and had seen one specimen from St. Petersburgh.

E. flavescens, L., is also all yellowish, but the palpi are darkened yellowish, never approaching black, the abdomen is shorter and thicker, and the hooks on the male genitalia black or blackened at their ends ; I have taken it from Lymington to Inveran.

E. lutea, Mg., I do not clearly know, it is smaller and darker than *E. flavescens*, and with greyer wings ; I believe I possess it, but my specimens are in very bad condition.

E. tænionota, Mg., is a very common and widely spread species, but as no continental writer seems to clearly recognise it, I append the following notes. It is smaller than *E. flavescens*, the middle of the thorax is brown, often almost blackish, forming a continuous line up to the very base of the antennæ ; if this middle line becomes very dark or broad, indistinct side lines begin to appear, and in one male I possess the whole central disc of the thorax might be described as blackish, leaving the sides ochreous and the pleuræ yellow (in this specimen the upper-side of the abdomen is also all brownish) ; the *collare* is whitish ; the antennæ all dirty-yellowish, if bent back not quite reaching the scutellum, the joints elongate, bearing on one side a hair considerably longer than the joint itself ; frons ochreous, dusky on the middle ; knob of halteres blackish. The two forks on the wing nearly equal, or the lower one a little the shorter, the last vein very much twisted. The male genitalia yellow, the lamellæ long and rather narrow, intercrossing at ends with blackish toothed hooks. I have met with it from Bickleigh Vale to Inchnadamph, the specimens from Inchnadamph being very dark on the thorax and the three lines coalescing ; it is abundant about a sort of sewage drain in a paddock near my house, and specimens were brought me once which were literally crowded together by hundreds on the under-side of a stone opening into a sewer.

Beyond these four there is certainly another British species with a curiously forked end to the hooks on the male genitalia, but I have never yet found it in abundance, and have failed to identify it with any described species.

Of the grey or black species, *E. fuscipennis*, Mg., is the smaller and blacker, and has the veins hairy all their length, while *E. trivialis*, Mg., has them hairy only on their ends. *E. trivialis* is very near the genus *Symplecta* but for these hairy ends to the veins, and I have seen it sometimes have a dark cloud crossing from near the end of the subcostal vein to the upper branch of the radial, resembling the supernumerary cross vein of *S. punctipennis*, Mg., only placed between different veins. Both species are common, and I have seen *E. fuscipennis* from Penzance to Tongue (I could not go much further), and *E. trivialis* from Lewes to Inchnadamph.

Lipsothrix errans, Wlk.: I have no doubt about the synonymy of this species, and, in accordance with Loew's doubt (Bes., Eur. Dipt., iii, 69), I can remark, that out of eleven specimens only one male has quite black knees; this specimen seems rather small, and with legs rather short and thin, but I do not think it distinct: others have the knees a little darkened. The species is at first glance so remarkably like the large yellow *Eriopteræ* or *Dicranomyiæ*, that I have no doubt it is often overlooked, but its very distinct neuration at once identifies it. I have taken it at Lyndhurst, Rotherfield and Wadhurst in Sussex, and Inveran in Sutherland.

(*To be continued*).

Note on the genus Eudectus.—Through the kindness of Herr Weise I have recently received an example of *Eudectus Giraudi*, Redt., and as I have just now before me the only example of *Eudectus rufulus*, Weise, found by Mr. Lewis in Japan, I have taken the opportunity to compare these examples with the unique specimen of our British *E. Whitei*. As the result of this comparison, I think all three should at present stand in the Catalogue of *Coleoptera* as distinct species. The differences in colour between the three are very marked; but as *E. Giraudi* is known to be variable in this respect, they may be considered to be of minor importance, and would be insufficient to substantiate the species if there were no other differences. Other differences are, however, numerous. *E. Giraudi* is larger than either of the other two insects, and is specially remarkable by the great development of the angular sides of the thorax, and the three conspicuous depressions on the disc of this part. In *E. Whitei* the thorax is much narrower, the angulation of the sides only slight, and the three discoidal impressions are obsolete. In *E. rufulus* the angulation of the sides can scarcely be seen, and the discoidal impressions are absent. *E. Giraudi* has the vertex of the head more densely punctured than it is in the Japanese and Scotch insects.

If these distinctions prove constant, the three insects are readily enough distinguished; but it is probable that other localities will yield specimens connecting them. At present they are all extremely rare, and are each restricted to widely separated habitats, Japan and the mountains of Scotland and Silesia; it may be taken for nearly certain, therefore, that *Eudectus* will be discovered in Siberia, and if so, I expect that all three forms will be connected.

Herr Weise made a journey from Berlin to Glatz to find *E. Giraudi*, and secured nearly a dozen examples; he informs me that it is a bark insect like *Coryphium*, whereas *E. Whitei* was found under a stone on the summit of a high mountain, but has not again been met with. Probably a Coleopterist working the old trees at the foot of Ben a Bhuird or other of the high mountains in the heart of the Grampians may be fortunate enough to meet with it.—D. Sharp, Southampton: *January*, 1887.

Chrysomela cerealis, &c., on Snowdon.—Ever since reading the record of the capture of *Chrysomela cerealis* on Snowdon by Mr. Champion (Ent. Mo. Mag., Sept., 1875) I have had a great desire to find this beautiful species in its habitat. Not until last summer, however, had I the opportunity of putting my desire into effect, and even then I felt that a journey to Snowdon for *cerealis* in August was a mistake. Nevertheless, by dint of most persistent work, my friend Mr. Wilding was at last successful in finding two specimens (either under one stone, or under two stones very close together), but though we searched most energetically, these were all that could be found. This year I made up my mind to spend a holiday on Snowdon in June, the time when the insect was taken by Mr. Champion, and I left home for this holiday, accompanied by my wife, on Saturday, June 26th. Travelling *viâ* Menai Bridge and Carnarvon we reached Llanberis in the evening, and found apartments (which I am extremely pleased to recommend to any intending visitors to this delightful district) at Cambrian Lodge. Mrs. Parry, our hostess, was so very obliging in various matters so necessary to an entomologist, and her charges so moderate, that I feel it necessary to repay her for her kindness by recommending her cottage to my friends.

The following morning we started for Snowdon, of course ignoring the many offers of guidance, and searched most carefully in any likely spot for our principal desideratum. No, no *cerealis!* although the day was just such as one could expect a *Chrysomela* to delight in. *Aphodius lapponum* was abundant in sheep dung, the red form (? immature), prevailing to a much greater degree than during last August. *Nebria Gyllenhalii* was common, but not nearly so abundant as on a previous visit. We found three specimens only of *Pterostichus æthiops*, a few *Patrobus assimilis*, a few *Corymbites cupreus*, var. *æruginosus* (all females), a single specimen of *Bembidium bruxellense* by one of the streams, and a single *Anthophagus alpinus* (?).

Tuesday passed in another careful search for *cerealis*, though I spent an hour or so beating the larches, &c., in the plantation through which the path leads. Here *Dascillus cervinus* was abundant, together with *Telephorus pellucidus*, *T. nigricans*, *T. alpinus* (a few), and other common species of the genus. Working in the streams below the path I found *Elmis æneus* in its usual situation, and *Agabus guttatus*, but no *Geodromicus globulicollis* where we had before taken it. We again met with one or two *Pterostichus æthiops*, and a single *Carabus catenulatus* was the only member of the genus found on Snowdon (another of the same species Mrs. Ellis found near the waterfall of Ceunant Mawr). I met with a single specimen of *Corymbites tessellatus*, sitting on a rush, and we took both type and variety of *C. cupreus*, which, in Cwm Brwynog at least, seems to be partial to the *Lycopodium selago*.

Wednesday was a complete failure, for though we walked through the Pass of Llanberis to Pen-y-pass Inn, and ascended Snowdon from thence, descending to Llanberis in the evening, the day was so dreadfully hot, that everything in the way of herbage, moss, &c., was burnt up, even large stones lying in the sunshine being too hot to touch. By the roadside in the Pass I picked up another *Corymbites tessellatus*, and among shingle on the bank of the stream which comes down from Cwm Glas I found a single *Homalota* which I believe to be *planifrons*.

On Thursday I started alone, and after four hours' hard searching, and hard work it was in the intensely hot sun, I at last dropped across a single *cerealis*. Only an enthusiastic entomologist can imagine my feelings when, in a moment more, there appeared, nearly in the same spot, a pair *in copulâ*, and then more until I had bottled what I thought were 20, but which proved to be only 17, all collected from a spot where there was very little thyme, and not more than a dozen paces square. The collection of these took nearly four hours, and there was not another to be found anywhere near.

On Thursday we felt too tired to attempt another day at *cerealis*, so walked across the mountains, the road lying between Moel Goch and Moel Cinghorion, to Snowdon Ranger, a walk of four miles only, but one which commands some of the finest scenery in the neighbourhood. Here, as on Snowdon itself, everything was scorched up with the intense heat, and no beetles were to be found.

Friday found us again on the spot where we had previously taken *cerealis*, but only a single specimen turned up. After a considerable ramble I happened, fortunately, to spy another individual at some distance from the other locality, and setting to work, I found the species again, this time in greater number, but still very local in their distribution, all occurring on a sloping bank where there was a profusion of wild thyme, but only a few square yards in extent. There I took also *Pterostichus æthiops* running in the hot sun. I most fully endorse Mr. Champion's remark that *cerealis* is "a beautiful object when crawling about in the sunshine." The individuals are easily seen when exposed, but they have a habit of "dodging" in and out of the herbage, so that one has to keep a sharp look out, and to pounce at once on the slightest twinkle of their exquisitely coloured elytra. They seem to be most plentiful about 2 p.m., when they are frequently seen *in copulâ*, but they require the hottest sunshine to bring them out, indeed, so hot was the bank on which they occurred, that it was quite uncomfortable to sit down upon. I was fortunate in this excursion to hit exactly the time of their emergence from the pupal condition, for not only were several of the specimens taken quite soft, but also we found no remains of dead specimens in the nests, beneath stones, of the very numerous and apparently well-fed spiders which abound on these slopes, and which, to judge of what remained of their meals, had dined freely upon everything else in the beetle line that we had come across in our travels.

I may mention, that throughout our various excursions, we found *Crambus furcatellus* common at any elevation above 1500 feet, but owing to my mistaking it at the time for *C. margaritellus*, I did not secure more than about half-a-dozen. Thoroughly satisfied with our hot but very successful holiday, we left for Llandudno on Saturday morning.—John W. Ellis, Brougham Terrace, Liverpool.

An Entomological trip to Sherwood Forest—With the double purpose of seeking healthful recreation in the enjoyment of sylvan scenery, and adding to our knowledge and collections of *Coleoptera*, we paid a visit, extending over eleven days, to "Merrie Sherwood" in the middle of last October. The previous experience of one of us was useful in settling a list of the species to be specially sought, nor were we far wrong in our calculations, for, with the single exception of *Teredus nitidus* (which positively declined to come to the front), we were fortunate enough to secure all the species bargained for, as well as a good few not on our programme.

During the first two or three days the rain fell almost incessantly, and we had to do our hunting in waterproof attire; but afterwards fairly fine weather favoured us, and we indulged in mutual congratulations on our good fortune. Our joy was, however, of short duration, for the midges ("jaspers" as they are called locally) became so troublesome as to render collecting (if not impossible)certainly very distressing, and after fully debating the question of the relative advantages of fine weather *versus* wet weather collecting, the vote went decidedly in favour of the latter. We found plenty of logs in the woods, although they were often difficult to "spot" owing to the luxuriant growth of bracken, and every day we discovered more fallen timber in excellent condition for the bark-knife than could be profitably dealt with, and were compelled to pass over much of it untouched; this we did with a mingled feeling of regret for our limited time and powers, and a benevolent satisfaction that we were leaving material for future explorers.

Standing trees, however decayed, and there were plenty of such, were absolutely unproductive, except when harbouring fungi, and then the fungus and not the tree was the source of profit.

Under the bark of logs and stumps (the remains of oak, birch, pine, beech, and a few other trees) in various stages of decay, we captured *Scydmænus Godarti*, *S. collaris*, *S. exilis*, *Eutheia clavata* (oak and birch), *Bythinus Curtisii*, *Batrisus venustus*, *Euplectus punctatus*, *E. Karsteni*, *E. nanus*, *E. nigricans*, *E. bicolor*, *E. nubigena* (1), *Ocalea castanea*, *Oxypoda incrassata*, *O. hæmorrhoa*, *Homalota æquata*, *H. linearis*, *H. pilicornis* (?), *H. immersa*, *H. xanthoptera*, *H. xanthopus*, *Placusa pumilio*, *P. denticulata* (?), *Cilea silphoides*, *Megacronus cingulatus*, *Mycetoporus lucidus*, *M. lepidus*, *Quedius cruentus*, *Q. xanthopus*, *Q. scitus*, *Q. nigriceps*, *Philonthus splendidulus* (commonly), *Xantholinus punctulatus*, *Coryphium angusticolle*, *Homalium pusillum*, *H. punctipenne*, *H. iopterum*, *H. concinnum*, *H. nigrum* (*var.* of *H. florale*), *Phlœocharis subtilissima*, *Ptinella testacea*, *P. denticollis*, *P. aptera*, *P. angustula*, *Pteryx suturalis*, *Cerylon angustatum*, *Plegaderus dissectus*, *Ips quadriguttatus*, *Agathidium nigripenne*, *A. seminulum*, *A. nigrinum* (one specimen also taken flying), *Rhizophagus depressus*, *R. cribratus*, *R. ferrugineus*, *R. nitidulus*, *R. dispar*, also several of a black variety of *R. bipustulatus* simulating *R. politus* exactly in colour, and a few examples of a *Rhizophagus* new to Britain, it is near *nitidulus* and *dispar*, but quite distinct from either; besides these occurred *Thymalus limbatus*, *Scaphisoma agaricinum*, *S. boleti*, *Scaphidium quadrimaculatum*, *Triphyllus punctatus*, *T. suturalis*, *Elater pomorum* (birch), *Rhagium bifasciatum*, *Tetratoma Desmaresti* (1), *Orchesia undulata* (which, fortunately, was not so skippish as in the summer months), *Trypodendron domesticum*, *T. quercus* (1); *Phlæotrya Stephensi* (dead) was every now and then turned out of burrows in the solid wood, which we fondly hoped would produce something more desirable.

In fungi on old trees and stumps (oak and birch) we found *Agaricochara lævicollis, Oligota apicata, Mycetophagus piceus, Cis hispidus, C. bidentatus, C. nitidus, C. fuscatus, C. festivus, Heledona agricola, Tetratoma fungorum.* A very diminutive Hymenopterous insect turned up in some numbers in a white fungus on birch, which we brought home in our pockets ; *Cis fuscatus* occurred abundantly in all stages of maturity in the same fungus ; possibly, therefore, the Hymenopteron is parasitic on the *Cis*, but Mr. Saunders, to whom it was sent for identification, has not yet reported.

The fungi growing in the soil were not as well tenanted by beetles as might have been expected, and we were therefore obliged to be content with the following species : *Homalota xanthoptera, H. æneicollis, H. ignobilis, H. boletobia, H. humeralis, H. marcida, H. muscorum, Quedius puncticollis, Q. lateralis, Cychramus luteus* and *C. fungicola* (in company), and *Cryptophagus lycoperdi.*

In carrion (dead sheep, hedgehog, moles and birds) we found *Oxypoda spectabilis* (1), *O. lividipennis, Aleochara mæsta, Homalota fungivora, H. gagatina, H. divisa, H. indubia, H. nigricornis, H. ravilla, H. corvina, H. sericea*, and another species, possibly *H. cribrata, Tricophya pilicornis, Philonthus cephalotes, Stilicus orbiculatus, Choleva tristis, C. grandicollis, C. Kirbyi, C. chrysomeloides, C. fumata, C. Watsoni, Carcinops* 14-*striata* (2), *Corynetes ruficollis*, and *C. rufipes.*

In straw heaps, placed by the keepers in various parts of the forest for the benefit of the pheasants, but which we did not work seriously for want of time, we captured *Homalota fungivora, H. ravilla, H. corvina, H. atricola, H. canescens, H. germana, H. parva, Oligota inflata, O. pusillima, Conurus lividus, Stilicus orbiculatus, Homalium fossulatum, H. cæsum*, and *Choleva velox.*

When resting and eating our frugal lunch the fallow deer which are in the enclosures, pert squirrels, and other animated objects, interested us much, as lovers of nature, by their curious ways and apparent tameness.—W. G. Blatch, 214, Green Lane, Smallheath, Birmingham ; A. C. Horner, Tonbridge, Kent : *December*, 1886.

Captures of local Hemiptera.—During the last two seasons I have captured the following species, which, being usually accounted scarce, appear to be worthy of record. *Lopus sulcatus*, early in July, near Fareham, Hants, by sweeping over waste ground ; abundant. *Lopus flavomarginatus*, at the same time and place ; scarce, I obtained only three. *Corixa Wollastoni* and *Gerris Costæ*, in pools about Llyn Idwoll, North Wales, in August.—Horace Francis, 8, Church Terrace, Lee, Kent : *December* 31*st*, 1886.

Anosia Plexippus (*Danais Archippus*) *at Shanklin.*—I have a butterfly, taken at Shanklin, Isle of Wight, which I believe is unknown to British collectors. Not mentioned in Newman's, or Coleman's, or Morris's, or Wood's works an entomology. The insect measures at least 4½ inches across, is of a bright Vandyke brown with black markings, similar to Black Veined White (*Aporia cratægi*), and has a white and spotted black edge to each wing, with deep black line on inner margin ; body is black, with white spots on thorax ; is in splendid condition, seemingly fresh from chrysalis.—J. A. Billings.

[The above notice appeared originally in the "Hampshire Independent," for December 18th, 1886, a cutting from which has been obligingly forwarded to us by the Editor. There can be no doubt that it refers to *Anosia Plexippus*, the migratory butterfly of which so many occurrences on our shores have lately been recorded.—Eds.]

Parasites on the genus Coleophora.—I have bred the following *Hymenoptera* from larvæ of the above genus—*Limneria volubilis*, Holm., from *C. albicosta*; *L. Elishæ*, Bridgman, from *C. flavaginella*, Lienig; and *Tetrastichus eudemus*, Walk., from *C. trifolii*, Curt.—C. W. Dale, Glanville's Wootton: *December 20th*, 1886.

Query respecting Aporia cratægi.—Is this butterfly still found in the south-eastern counties of England, as it is almost the only one of which I do not see captures recorded in the Magazines?—Id.: *December 30th*, 1886.

[We have no reason to doubt that this butterfly still occurs in its usual numbers in the district between Herne Bay and Canterbury. We shall be glad of information if such be not the case.—Eds.]

On the flight and pairing of Hepialus sylvinus and lupulinus.—I was fortunate enough this year to witness the manner in which *H. sylvinus* pairs, and, though the observation is a solitary one, I think it conclusive that the female attracts the male, and feel sure future observations will confirm this. I had sugared some posts on the railway side, and was wandering about in the twilight, looking for nothing in particular, when my attention was drawn to a large moth fluttering in a peculiar manner on a stem of grass: it seemed as though it were trying to escape from something that held it fast; thinking some large spider, or other predaceous creature, had hold of it, I lit my lantern, and then saw it was sitting on the stem vibrating its wings with such rapidity that I could not possibly see what the species was. I watched it closely, and presently a small moth, unheeding the glare of my lantern, flew to it. I needed to be very quick to secure it before they paired. The vibratory motion of the wings of the sitting moth ceased as soon as the other touched it, and I saw it was an extra large female *sylvinus*. For nearly ten minutes she remained motionless, then after a preliminary flutter or two, the motion of the wings recommenced, and presently another male flew up: this time they were too quick for me, and the pairing was accomplished. Following up the clue afforded by Mr. Barrett's observation, I have no hesitation in concluding, though my olfactory nerves were not sensitive enough to detect the scent, there in the open air, that an attractive odour was emanating from the female which the vibratory motion of her wings was assisting to disseminate. *Sylvinus* is easily taken *in cop.*, sitting after dark on the herbage. To confirm the above observation, they should be looked for before dark, for the female evidently never stirs from the place where she emerges.

I have never seen *H. velleda* pair, but a correspondent informs me that he has seen a female, when newly emerged, dragging her long abdomen along the surface of the ground, seeking some stem on which to hang till her wings expanded, but even then attended by a number of males. This would seem to be attraction of the ordinary kind, but as the species is generally very abundant where it occurs, it might not be difficult to watch the whole process.

The males of *H. lupulinus* fly just above the top of the herbage. Their flight is swift, but very erratic, and quite different to that of any other of the genus. Like that of the others, it only lasts a comparatively short time, and there is no doubt they are then seeking the females. The species swarms here, and the males may be seen in scores, careering along just before dusk, but though it is so abundant, and though I have watched them repeatedly, I never saw them pair. Possibly the females diffuse an odour as I suppose the female of *sylvinus* does, but if it be so, they certainly do not expose themselves in the way the female *sylvinus* mentioned above did. It may, however, be that some mode of attraction, different to those already known, obtains with *lupulinus*, for of the three species first named, of which I can speak with any certainty from what I have seen myself, quite different habits are found. The males of *H. hectus* fly while diffusing an odour to attract the females. The females of *H. sylvinus* sit while probably doing the same thing to attract the males; while the male of *H. humuli* undoubtedly attract the opposite sex by its light colour being easily seen as it vibrates to and fro in the twilight. It is curious, too, that the same mode of flight should be adopted by two species, while the actual means of attraction is so different, as in *hectus* and *humuli*. It would be interesting to know what are the habits of other species occurring elsewhere. Have any such been recorded?—JOHN E. ROBSON, Hartlepool: *December 7th*, 1886.

[In the Pyrenees there exists a species of *Hepialus* (*H. pyrenaicus*, Donzel) of which the ♂ is somewhat similar to that of *H. lupulinus*, but of which the ♀ is nearly apterous, and utterly incapable of flight. But any collector so fortunate as to obtain a virgin ♀ can secure as many ♂ as he may desire. They "assemble" just as in the case of certain *Bombyces*, &c. Possibly some correspondent in New Zealand, Chili, &c., can enlighten us as to the behaviour of the gigantic *Hepialidæ* there found.—EDS.]

Review.

THE LEPIDOPTERA OF SUSSEX.—List of *Lepidoptera* observed in West Sussex. By W. H. B. FLETCHER, M.A., F.E.S. (Transactions of the Chichester and West Sussex Natural History Society, No. 5, new series, 1886). List of the *Macro-Lepidoptera* of East Sussex. By J. H. A. JENNER, F.E.S. (Proceedings of the Eastbourne Natural History Society, 1885—86).

Sussex has always been a county having the advantage of possessing numerous resident entomologists, centered especially in Lewes, Brighton, Hastings, and Worthing. The Hastings contingent have published two useful Lists of the Insects of the district, already noticed in our pages. The two Lists now before us are of great local value; but it is scarcely possible to compare one with the other on account of the differing conditions. Mr. Fletcher's predilections are (as every one knows) especially on the side of *Micro-Lepidoptera*, and he enumerates over 400 species of those, and only about 250 species of *Macro-Lepidoptera*, amongst which we find no mention of *Sterrha sacraria* (*cf.* Trans. Ent. Soc., ser. 3, vol. ii, 1866). The *Tineina* are greatly elaborated; there are no less than 32 species of *Nepticula*, 16 of *Lithocolletis*, 29 of *Coleophora*, and so on in proportion. Mr. Jenner, on the contrary, has not yet attempted to enumerate the *Micros*, but he catalogues 627 species of *Macros*, with special indications for the five divisions into which the river-system of East Sussex resolves itself. He has the advantage of being able to include the well-worked Hastings district in his List. It is convenient to notice these two Lists under one heading, but from special circumstances it is impossible to make any further comparison that would be of service. Each has its value in differing directions.

Obituary.

Jules Lichtenstein.—It is with great regret we announce the decease, on the 30th November last, at Montpellier, of this well-known entomologist, at the age of 68. In the summer of last year he had a paralytic stroke, but no immediate danger was anticipated. To the readers of this Magazine his name will have become familiar by the numerous papers and notes he published in its pages on the habits of *Aphides*, *Cynipidæ*, *Tenthredinidæ*, &c., always written in English, and printed almost as written : indeed, it is probable he was at one time resident in England. Lichtenstein was, we think, a descendent of the old German naturalist of that name, who published much in many departments of Natural History, and whose earlier writings appeared in the Transactions of the Linnean Society of London. The subject of this notice was a vineyard-proprietor, and his entomological energies seem to have been especially aroused by the appearance of the *Phylloxera*, when he was about 50 years of age. Since that time, and down to his illness, he was a most industrious worker and observer of phytophagous insects generally, with great originality of deductiou. Probably we may again have occasion to refer to his labours when more precise data as to his early life come to hand. This short notice is scarcely a fitting tribute to the memory of a man so thoroughly *sui generis* in all his writings.

Entomological Society of London: Anniversary Meeting, *January 19th*, 1887.—Robert McLachlan, Esq., F.R.S., President, in the Chair.

An Abstract of the Treasurer's Accounts was read by Mr. Stainton, one of the Auditors ; and the Secretary read the Report of the Council, which was received and adopted.

The following gentlemen were appointed to serve as Officers and Members of Council for 1887 :—President, Dr. David Sharp, F.Z.S. ; Treasurer, Mr. Edward Saunders, F.L.S. ; Secretaries, Mr. Herbert Goss, F.L.S., and the Rev. W. W. Fowler, M.A., F.L.S. ; Librarian, Mr. Ferdinand Grut, F.L.S. ; and as other Members of Council : Messrs. Robert McLachlan, F.R.S. ; Gervase Mathew, R.N., F.L.S. ; George T. Porritt, F.L.S. ; Edward B. Poulton, M.A., F.G.S. ; Osbert Salvin, M.A., F.R.S. ; Henry T. Stainton, F.R.S. ; Samuel Stevens, F.L.S. ; and J. Jenner Weir, F.L.S.

The retiring President delivered an address, and a vote of thanks to him was moved by Mr. E. B. Poulton, seconded by Prof. Meldola, and carried.

A vote of thanks to the Treasurer, Secretaries, and Librarian was moved by Mr. McLachlan, seconded by Mr. Stainton, and carried ; and Mr. Goss and Mr. Grut replied.

A vote of thanks to the Council was proposed by Mr. Waterhouse, seconded by Mr. White, and carried.—H. Goss, *Hon. Sec.*

IS *APORIA CRATÆGI* EXTINCT IN ENGLAND?

BY HERBERT GOSS, F.L.S.

Mr. Dale's enquiry in the February number of this Magazine, as to the occurrence at the present day of *Aporia cratægi* in the south-east of England, induces me to raise the question of whether this species is dying out, not only in the south-east, but in all parts of this country. During the last ten years it has, to my knowledge, disappeared from all the localites in the New Forest, and in Monmouthshire, where it was formerly found in abundance.

The counties in which *Aporia cratægi* formerly occurred, and from all of which it has, apparently, now disappeared, are Kent, Sussex, Hampshire, Huntingdonshire, Northamptonshire, Herefordshire, Monmouthshire, and Glamorganshire. I do not say that the species has never been taken in other southern, western, and midland counties; but those above named are the counties where the species most regularly and constantly occurred.

Kent.—It is well known that less than thirty years ago this species was plentiful in various parts of this county, especially about Wye, Ashford, Strood, Rochester, and the district between Herne Bay and Canterbury. In 1864, an old botanical friend of mine having informed me that, twenty years previously, when he resided at Wye, *Aporia cratægi* was the commonest butterfly in the neighbourhood of that place, I went with my father, on his recommendation, to stay there in the middle of June of that year. For upwards of three weeks we diligently explored the country about Wye, Ashford, Westwell, Chilham, Canterbury, Sturry, and Herne Bay; but during the whole of this period we never caught, or even saw, a specimen of this species, which I was assured by Mr. Robert Dombrain, then "reading" with a clergyman at Wye, had disappeared from the district since 1859. In lieu of *Aporia cratægi*, I had to content myself with a series of *Scoria dealbata*, then considered a much greater rarity than at the present day.

Sussex.—Mr. Jenner Weir has often told me that *A. cratægi* used to occur in great numbers near Keymer, and elsewhere, in Sussex, many years ago, but that he had only seen one specimen of it in the county since 1840.*

Hampshire.—My earliest capture of *A. cratægi* was made when I was a boy, on my first visit to Lyndhurst, as long ago as June, 1862.

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* See Proc. Ent. Soc. Lond., 1884, p. 5.

On the 21st June, 1866, I caught eight specimens of this species on the open heath lying between Park Grounds enclosure and Park Hill enclosure, in the New Forest; and, on the following day, having explored the then, to *me*, unknown Forest some three miles to the west of this place, near Boldrewood, I suddenly came upon a colony or metropolis of this species, and in the course of two or three hours secured several dozen specimens. In June and July, 1868, the species was still more plentiful in the New Forest, especially between Boldrewood and Burley, about Puck Pits, Holm Hill enclosure, Vinney Ridge, Rhinefield Old enclosure, and in Warickslade—a long open space, full of old thorns and sloe-bushes, and well known as a locality for *Gladiolus illyricus*,—lying between the enclosure last named, and the Great Huntley Woods, and extending nearly as far east as Queen's Mead. By midsummer, 1870, the species had increased and multiplied in these localities to such an extent as to render the discovery of the pupæ on sloe-bushes, and the capture of five or six dozen imagos in the course of a few hours a matter of ease. Besides this, the distribution of the species had extended from Vinney Ridge and Warickslade to Alum Green and Butt's Lawn on the north, and as far east, and south-east as Denny Wood and Wood Fidley.

After the wet summer of 1871, *Aporia cratægi* gradually became scarcer in the New Forest. In 1872, it was again chiefly restricted to its head-quarters in the neighbourhood of Burley, Boldrewood, and Vinney Ridge, and its numbers were apparently reduced from hundreds to a few dozens. By 1875, the species had become still rarer; and in 1878 I caught my last specimen in the New Forest. Since that year I have never seen it in the district, nor have I heard of the capture by any of the local collectors of a single specimen since 1880.

HUNTINGDONSHIRE.—When staying with my father at Oundle, Northamptonshire, in June, 1865, for the purpose of collecting in Barnwell Wold, we visited Gidding Magna, and other places in the neighbourhood where the Rev. W. Bree used formerly to collect the species; but we never succeeded in finding it in this county.

NORTHAMPTONSHIRE.—In Stainton's "Manual," Peterboro' is given as a locality for this species; but I have never found it in this neighbourhood, nor at Oundle, Barnwell, or any other part of the county with which I am acquainted; nor have my correspondents, in this and adjoining counties, reported its capture for many years past.

HEREFORDSHIRE.—The late Edward Newman has recorded *A.*

cratægi as formerly common near Leominster; but I never saw it in this county when staying at Hereford and Holm Lacy in 1867 and 1877.

MONMOUTHSHIRE.—Between the 24th and 29th June, 1867, I found this species, not uncommonly, in grass fields about one mile and a half to the north-west of Tintern, in the direction of Trelleck; and on the 4th of July of that year I discovered another locality one mile due west of Tintern, where the species occurred in the greatest profusion. Hundreds of specimens were flying about, or settling on the flowers of the Ox-eye daisy (*Chrysanthemum leucanthemum*), and on thistles, and I was frequently able to capture five or six specimens at one stroke of the net. The same locality also produced numbers of *Callimorpha dominula*.

Having secured a long series of *A. cratægi* in the New Forest in the previous year, I did not care to take a large number of the Monmouthshire specimens, but directed my energies to collecting *Vanessa c-album* and other species which occurred sparingly and required working for, and also to "sugaring" at night, which proved unusually attractive, especially to *Thyatira derasa*. Ten years after, on the 30th June, 1877, I again arrived at Tintern, and lost no time in revisiting the old *cratægi* localities, the natural conditions of which were unchanged; but instead of the swarms of this butterfly, which occurred there in 1867, only two specimens were seen during the whole of a fine summer's day!

GLAMORGANSHIRE.—During the years 1868 and 1869, I received liberal supplies of the larvæ of this species from two or three correspondents in this or adjoining counties. My correspondents have since reported the butterfly as apparently extinct throughout an entire district where it formerly abounded.

If, as appears to be the case, *Aporia cratægi* is really on the verge of extinction in England, to what causes is the result due?

The almost simultaneous disappearance of the butterfly from all its former localities, from Kent and Hampshire in the south-east and south, to Monmouthshire and Glamorganshire in the west, and Northamptonshire and Huntingdonshire in the midlands, cannot be attributed to the rapacity of collectors. It is possible that cultivation and drainage may account for the disappearance of this species from some of its former localities; though from the nature of its food-plants this seems improbable, as an abundance of hedgerow shrubs, like the whitethorn and blackthorn, and orchard trees, such as plum and apple, is not inconsistent with the highest state of cultivation.

Admitting, however, that drainage and "high farming" may possibly be the cause of the extinction of the species in some places, its disappearance from the New Forest cannot be thus explained: for the natural conditions of that district, with its vast moors, oak woods, dense beech groves, old thorns, and thickets of sloe-bushes, have undergone little change during the last five hundred years.

It seems more probable that the extreme scarcity, or total disappearance of the Black-veined White may be due to a succession of wet ungenial summers and mild winters. There are probably also other climatic changes in progress which, though imperceptible to us, may be the cause of the scarcity, or total extinction of this and other species formerly common in the United Kingdom.

Although the extinction of *Aporia cratægi* in England in the near future does not seem improbable, I trust that captures of the species during the coming season, may be recorded from many parts of England, and that the foregoing observations will be proved to be those of a pessimist.

Berrylands, Surbiton Hill:
February 5*th*, 1887.

The decadence of Aporia cratægi in Kent, and its probable cause.—The Editors of the Ent. Mo. Mag., in their last number in a note to a query by Mr. C. W. Dale, say, "We have no reason to doubt that this butterfly (*A. cratægi*) still occurs in the usual numbers in the district between Herne Bay and Canterbury." At the last meeting of the South London Entomological Society, the decadence of *A. cratægi* in Kent was somewhat fully discussed, and no member of the Society (present at the meeting) had taken the insect for many years in the localities that some years since produced it in such abundance. As a native of one of the localities (Strood, near Rochester), where it was most abundant (1850—1866), I can safely say that it has been exceedingly rare there, if not extinct, for some sixteen years. When I first commenced collecting butterflies in 1871, I was delighted by a local Entomologist (who had not collected since 1866 or '67, and since deceased) giving me several of our British butterflies, among them a number of *A. cratægi*, which he said was one of the most common butterflies in the district. The species, he said, abounded in the larval state on the whitethorn hedges surrounding a number of grazing fields near Strood (almost in the town), their webs being very conspicuous. Of course I searched for it, but in vain, and the only specimen I captured was in 1872 at Caxton in a clover field. Until the end of 1875 I was most energetic and scoured the district for miles around without success. I captured 47 species of our British butterflies in the years 1872—75 in that district, but never met with more than this one specimen, and have never seen it since. I have been repeatedly over many of its old haunts at the right time. Pupæ of the species have been offered occasionally for sale, but only, I believe, by dealers in foreign insects. May I suggest that migration lies at the bottom of the probable cause of the great falling off observed in the numbers of this species? I do not think enough attention has been paid to the migration of insects as the chief source of supply of most of our species that occur in an erratic manner. I believe there is a great deal in the erratic appearance of our insects, that migration has to account for. Certain species (I suppose every one will grant) do migrate in immense numbers, and these are generally those which are locally abundant. What is more probable than that species, which have their natural home in the South of Europe, having arrived here, should fail to establish themselves in our changeable climate? That they are found a few years in succession does not prove that our climate is suited to them, but that their vitality is at its greatest and unimpaired when they arrive, and that the following seasons may be suitable for their development. *A. cratægi* will probably become common again, but not, I believe, until we get a fresh stock from the continent. I believe broader views on this subject are now taken by those British Entomologists who study *Lepidoptera* as a scientific recreation, but, of course, such opinions will never be adopted by *collectors* to whom a continental specimen is intolerable, even as a type for reference.—J. W. Tutt, Rayleigh Villa, Westcombe Park, S.E.; *February*, 1887.

NOTES ON THE SECOND EDITION OF CURTIS' BRITISH ENTOMOLOGY.

BY H. T. STAINTON, F.R.S.

That a second edition by John Curtis of any portion of the British Entomology existed was to me quite a piece of news.

Hagen, in his Bibliotheca Entomologica, does not seem to have had *personal* knowledge of the fact, though he says: "Nach Percheron ist von den ersten Nummern eine zweite Auflage erschienen."

In vol. xvi of the British Entomology, on the page which immediately follows the list of subscribers, a note occurs as under:

"The following is a list of the contents of the letter-press of folios 1 to 18, which have been reprinted and enlarged:

Folio	1—4 pages,	6	species described.	Folio	10— 2 pages,	3	species described
,,	2—2 ,,	2	,,	,,	11— 2 ,,	2	,,
,,	3—4 ,,	7	,,	,,	12—10 ,,	19	,,
,,	4—2 ,,	3	,,	,,	13— 2 ,,	1	,,
,,	5—2 ,,	7	,,	,,	14— 2 ,,	1	,,
,,	6—2 ,,	3	,,	,,	15— 4 ,,	13	,,
,,	7—4 ,,	2	,,	,,	16— 8 ,,	56	,,
,,	8—6 ,,	21	,,	,,	17— 2 ,,	3	,,
,,	9—4 ,,	7	,,	,,	18— 4 ,,	30	,, "

Thus, to these 18 species there are 66 pages of letter-press, whereas in the original edition there are only 36 pages, showing an addition of 30 pages, besides there being frequently additional matter, even where the original allowance of two pages is not exceeded.

The 18 species which attained this distinction of a reprint may be arranged systematically as under:

COLEOPTERA.

Cicindela sylvicola	folio 1	2 additional pages
Nebria livida	„ 6	
Omaseus aterrimus	„ 15	2 additional pages
Molorchus minor	„ 11	

HYMENOPTERA.

Crœsus septentrionalis	folio 17	
Peltastes pini	„ 4	
Chrysis fulgida	„ 8	4 additional pages
Eumenes atricornis	„ 13	

LEPIDOPTERA.

Lycæna dispar	folio 12	8 additional pages
Deilephila euphorbiæ	„ 3	2 additional pages
Odonestis pini	„ 7	2 additional pages
Peronea ruficostana	„ 16	6 additional pages

HEMIPTERA.

Velia rivulorum	folio 2	
Notonecta maculata	„ 10	

DIPTERA.

Ctenophora ornata	folio 5	
Anthrax ornata	„ 9	2 additional pages
Empis borealis	„ 18	2 additional pages
Hæmobora pallipes	„ 14	

It will thus be seen that 18 of the 30 additional pages are devoted to the *Lepidoptera*; the three Orders, *Coleoptera*, *Hymenoptera*, and *Diptera* having each only four additional pages allotted to them.

In folio 12, *Lycæna dispar*: in the original edition the letter-press was restricted to the generic characters, a description of the one species *dispar*, and a notice of its occurrence. In the second edition the 10 pages of letter-press include descriptions of 5 "coppers" and 10 "blues," and some additional notes on the larva and pupa of *Lycæna dispar*, of which Curtis had received living examples subsequent to the publication of the original letter-press of folio 12, and *which he added to the plate.* The original plate having no representation either of the larva or pupa.

In folio 3, *Deilephila euphorbiæ*: the original edition contains only the generic characters, a description of *euphorbiæ*, and a note of its occurrence. In the second edition, the 4 pages of letter-press contain descriptions of 7 species of *Deilephila* (this including three which we now refer to the genus *Chœrocampa*).

I find from a sentence in folio 6, which treats of *Nebria livida*, that Mr. Curtis visited Braunton Burrows, North Devon, in September, 1822, in search of the larvæ of *Deilephila euphorbiæ*; it seems rather singular that this fact is not mentioned in the letter-press treating of the last-named insect.

Mr. Curtis' search at Braunton Burrows for the larvæ of *D. euphorbiæ* in 1822 was unsuccessful, and so was my own pilgrimage to the same spot some 35 years afterwards.

In folio 7, *Odonestis pini* is referred in the second edition to the genus *Dendrolimus*, and a much more detailed generic character is given; the two additional pages are devoted to *Odonestis potatoria.*

In folio 16, *Peronea ruficostana*: the original edition gives only the generic characters, and a description of *ruficostana*, with a list of some 42 species. In the second edition, in which the letter-press runs to 8 pages, 56 species (or what were *then* reputed as species) are described. I said *then* reputed, but the question is, *when*?

This second edition bears no date; but references are made in the reprint of folio 16 to Stephens' "Illustrations," and a description is copied from that work, which, by a reference to the page of the Illustrations, we learn was published "August 30th, 1834."

The date must, therefore, have been subsequent to that, and before the completion of the last (the 16th) volume of the British Entomology, the dedication page of which bears the date December 1st, 1839.

The Linnean Society possesses a copy of the original edition, the Royal Society a copy of the second edition of the British Entomology of John Curtis.

Mountsfield, Lewisham, S.E.:
January 31*st*, 1887.

The Curtis collection.—In September last I made an inspection of the collection of English insects formed by Curtis, now in the posession of the University Museum, Melbourne. It will probably interest many to know that this collection remains in admirable condition; the drawers clean, and the specimens sound and fresh-looking throughout. Mr. Kershaw, the entomological curator, informed me that his principal trouble had been with verdigris; but that the collection was, so far as he knew, as complete as when received. I failed to find the type of *Eupœcilia anthemidana*, which Lord Walsingham had asked me to examine; there was no such name in the cabinet at all, and I think there can be no doubt that the insect never formed part of this collection. It is gratifying to find that these specimens have been as carefully and skilfully preserved as they could have been in England; but I would remark that the collection is really of no particular scientific utility in Australia—indeed, I doubt if any one there, besides the Museum authorities, knows of its existence—and I am surprised that some English Museum does not attempt to secure it by exchange, which might well be made very advantageous to both parties.—E. MEYRICK, Ramsbury: *January* 31*st*, 1887.

ON THE MOULTING OF THE LARVA OF *ORGYIA ANTIQUA*.

BY T. A. CHAPMAN, M.D.

I was led five years ago to make the following observations by Mr. Hellins having noted a variability in the number of moults this species underwent. I was also interested in the general question, as to how many was the normal number of moults in *Lepidoptera*, and whether the larva in each skin was to any degree distinct and definite, in the same sense that the larva is distinct from the pupa and that from the imago.

I may at once say that some of the larvæ which I reared moulted only three times, some four times, and some five times.

In its 1st skin the larva is very definite and easily distinguishable (apart from size) from those in the following skins, being black and very similar to an *Arctia* larva, in that it possesses a set of tubercles set with bristles, each tubercle and the hairs it carries being very similar to its fellows. It differs from *Arctia* in one very important point, viz., that each segment has only ten tubercles, instead of twelve as in *Arctia*, and in a more conspicuous though less important matter, namely, that the lateral tubercles of the second segment are very prominent and large. But it has no trace of the tufts of barbed hairs afterwards carried, nor any trace of the scarlet tubercles of the 10th and 11th segments, though traces of these and some coloration are distinguishable shortly before the first change of skin.

In the 2nd skin it is equally distinct and definite. It is now clearly of the *Liparis* family. The scarlet cups of the 10th and 11th segments are very distinct, the lateral tufts of the 2nd segment are represented by a few long special hairs, and the *dorsal* brushes of the 5th to 8th segments are represented by black pads (fused tubercles as it were) with a few special barbed hairs; all the hairs are still black.

In the 3rd skin the majority are easily distinguishable. The subdorsal tubercles are now pink, the barbed tufts are distinct on the 2nd, on the back of the 5th—8th segments, and on the 12th segment, the tufts of 5th and 6th are dark, from fuscous to black, those of 7th and 8th are pale.

In the 4th, 5th, and 6th skins the dorsal tufts are all pale in colour, and the lateral tufts of 5th and 6th segments appear. Though the latter are wanting in some, and in others there is a distinctly darker shade on the dorsal tufts of the 5th and 6th segments.

It thus happens that in a few of those in the 3rd skin there is a slight approach to the panoply of the 4th skin, whilst again in the 4th skin some specimens approach the appearance of the 3rd ; so that whilst the majority are abundantly distinct in these skins, in a few it is impossible to decide to which skin they belong.

From the 4th skin onward they are indistinguishable, although in the later skins the larvæ are more certainly furnished with the lateral tufts, and the dorsal tufts are more certainly of a uniform tint. But a larva in its 4th skin may be as mature in these respects as one in its 6th skin.

The first three skins, therefore, seem to be definite and fixed forms; the variability in moulting occurs in the later stages. When we come to enquire into the significance of this variability, we meet at once with one very decided fact, and that is, that those that moult only three times always produce male moths, those that moult five times always produce females, those that moult four times produce both.

We may go on one step beyond this. The apterous females of *O. antiqua* render in this instance more than usually marked the circumstance that is usual amongst insects, that the female is much larger than the male, from the fact that she contains a large number of eggs. There is another circumstance that is also usually associated with this fact, and that is, that the male emerges from the pupa a few days before the female.

Now, if we take the four-moulters, consisting of both males and females, this is not so, the females emerge first, but if we associate them in this order—

3-moulter males.	4-moulter males.
4-moulter females.	5-moulter females.

we find that the usual rule of the males emerging first is observed.

This also shows more distinctly that another rule obtains in *O. antiqua.* It is one that obtains among bees, and would, I think, be found in other insects if observation on the point were made. It is this, that the male, though feeding as larva a shorter time (being a smaller insect), remains a longer time in the pupa state than the female, apparently requiring a longer time to undergo its full development.

It would thus appear that in *O. antiqua* the female moults one time more than the male, a circumstance that I have not seen noticed as occurring in any species, and that further the moults may vary by one.

I do not think my observations justify any conclusions as to the circumstances governing this last point.

In a set of larvæ reared carefully the 3 ♂ and 4 ♀ moulters were fully as numerous as the 4 ♂ and 5 ♀ moulters, but in a set reared carelessly, in so far that many were kept in one vessel, and their food being taken from different trees (always pear) at different times, was sometimes obviously unpalatable; there were hardly any 3 ♂ and 4 ♀ moulters, but there was a large mortality among these, and it is equally possible to conclude that the hard conditions of life killed the 3- and 4-moulters as that they changed them into 4- and 5-moulters.

These points then remain for further investigation. What determines whether or no a larva shall moult the additional time? Is it already pre-determined before it leaves the egg, or does it depend on conditions of weather, feeding, &c.? Would it be possible by selection to raise a race of *antiqua*, consisting entirely of 3- and 4-moulters, or again of 4- and 5-moulters, or of 4-moulters only? Do such species in any way occupy an intermediate position between others moulting on the one hand 4 times, and on the other 5 times as a fixed number?

Several species which hibernate in the larval stage are known or believed to vary in the number of moults, and hairy larvæ which are said to vary in the number of moults, include many species that hibernate as larvæ. It is, therefore, of interest to note that *O. antiqua*, though not hibernating, is closely related to several species that do so, such as *O. fascelina*, and the allied arctic species which is believed to pass more than one winter in the larva state.

If hibernation and variation in moulting are related, it would appear probable that the additional moults are a provision for prolonging the duration of the feeding period after an exceptionally bad time during the winter, and that the number of moults in any individual may vary according to its requirements determined in this manner, or on the other hand a less number of moults may represent what occurs in many species, viz., a rush to reach the perfect state as early as possible, and so escape hibernation and to become double-brooded.

This suggests the enquiry whether the summer broods of such species as *Selenia lunaria* and *illunaria*, which are smaller than the type, and have been described as distinct species, moult as often as the autumn brood.

Further investigation thus promises to throw valuable light on several questions concerning variability.

An isolated observation on *Acronycta alni* bearing on this matter may be worth mentioning. A few eggs were given me, from which I reared 5 *larvæ;* 4 of my larvæ moulted 4 times, but the 5th moulting rather earlier than the others, so as to gain two days in 4 moults, in moulting the 4th time did not assume the adult livery, but was still in the "bird-dirt" stage, though larger than its fellows in that stage, and possessing the full complement of clubbed hairs, although they were pale and slender. It moulted an additional or 5th time, and then assumed the adult livery, and was larger than the others were, and had the clubbed hairs 1 mm. longer than theirs, and remained feeding 4 days longer.

Binghill, Hereford:
February 2nd, 1887.

ON THE PRIORITY OF VARIOUS GENERIC NAMES IN USE IN BRITISH *COLEOPTERA*.

BY G. C. CHAMPION, F.E.S.

Now that a new Manual of British *Coleoptera* is in course of publication, it seems to me worth while to call attention to certain generic names which are employed not only in this, but also in other sections of zoology. The following list, compiled chiefly from the works of Agassiz, Marschall, and Scudder, shows the year of publication, &c., of the most important of these:—

Acalyptus, Schönh., Col., 1836; *id.*, Dum., Rept., 1853 (*Acalypta*, Westw., Hem., 1840).——*Acrognathus*, Er., Col., 1839; *id.*, Agass., Pisces, 1843.——*Alexia*, Leach, Moll., 1818; *id.*, Steph., Col., 1835 (= *Sphærosoma*, Leach, 1819, = *Hygrotophila*, Chevr., in Dej. Cat., 1834). This name being pre-occupied in Mollusca, a new one is required in *Coleoptera*: *Sphærosoma* is not available, it being already in use in *Crustacea* (Leyd., 1851) and in *Histeridæ* (Mars., 1855); *Hygrotophila* could, however, be used.——*Anomala*, Steph., Col., 1830; *id.*, Schmidt, Moll., 1832.——*Anoplus*, Schönh., Col., 1826; *id.*, Gray, Rept., 1840; *id.*, Schl., Pisces, 1842.——*Atomaria*, Kirby, Col., 1830; *id.*, Bigot, Dipt., 1854.

Barynotus, Germ., Col., 1817; *id.*, Günther, Pisces, 1868.——*Bostrichus*, Geoffr., Col., 1764; *id.*, Fabr., *ib.*, 1775; (*Bostrychus*, Lacèp., Pisces, 1800). This name is generally written *Bostrychus* in *Coleoptera*, thus clashing with that of Lacèpede.——*Brachonyx*, Schönh., Col., 1826; *id.*, Swainson, Aves, 1837.——*Brachypterus*, Kug., Col., 1794; *id.*, Grav., Hymen., 1829; *id.*, Less., Aves, 1837; (*Brachyptera*, Newp., Neur., 1851; *id.*, Feld., Lep., 1874).——*Brontes*, Fabr., Col., 1801; *id.*, Montf., Moll., 1810; *id.*, Goldf., Crust., 1839; *id.*, Val., Pisces, 1840.

Calandra, Clairv., Col., 1798; *id.*, Less., Aves, 1837.——*Calodera*, Mann., Col., 1830; *id.*, Gould, Aves, 1836.——*Cantharis*, Linn., Col., 1735; *id.*, Geoffr., *ib.*, 1764; *id.*, Fer., Moll., 1821.——*Claviger*, Preyssl, Col., 1790; *id.*, Hald., Moll., 1842.——*Colymbetes*, Clairv., Col., 1806; *id.*, Hübn., Moll., 1810.——*Conipora*, Blainv., Pol., 1834; *id.*, Sharp, Cat. Brit. Col., 2nd edit., p. 27 (1883), (= *Aspidiphorus*, Ziegl., 1821); (*Coniporus*, Thoms., Col., 1859). *Aspidiphorus*, sometimes written

Aspidophorus, is also pre-occupied by Lacèpede (Pisces, 1802). If we adopt Thomson's name, which is quite as objectionable as that of Ziegler, and for the same reason, it should be written *Coniporus*.—— *Conurus*, Kuhl, Aves, 1820 ; *id.*, Steph., Col., 1832 ; *id.*, Sharp, Cat. Brit. Col., 2nd edit., p. 10 (1883) ; (= *Conosoma*, Kraatz, 1858), (*Conura*, Spin., Hymen., 1837). *Conurus* cannot be used in *Coleoptera*, Kraatz's name should be adopted.——*Corynetes*, Herbst, Col., 1792 ; *id.*, Hæck., Med., 1879.—— *Crypticus*, Latr., Col., 1817 ; *id.*, Swains., Aves, 1837.—— *Cymindis*, Latr., Col., 1806 ; *id.*, Cuv., Aves, 1817.

Dascillus, Latr., Col., 1796 ; (*Dascyllus*, Cuv., Pisces, 1829).—— *Dendrophilus*, Leach, Col., 1817 ; *id.*, Fitz., Rept., 1826 ; (*Dendrophila*, Swains., Aves, 1837 ; *id.*, Lioy, Dipt., 1864).——*Diglossa*, Wagl., Aves, 1832 ; *id.*, Halid., Col., 1837. This name being pre-occupied in Aves, it might, perhaps, be written *Diglotta* in *Coleoptera* ; Kraatz having already used *glotta* instead of *glossa* in an allied genus (*cf.* Berl. ent. Zeit., 1862, p. 300).——*Dolichosoma*, Steph., Col., 1832 ; *id.*, Huxl., Saur., 1867.——*Drusilla*, Leach, Col., 1819 ; *id.*, Swains., Lep., 1821.——*Dryophilus*, Chevr., Col., 1832 ; *id.*, Fitz., Rept., 1843.

Elenchus, Humphr., Moll., 1797 ; *id.*, Curt., Streps., 1831. A new name is required for this genus of *Stylopidæ*.——*Eryx*, Daud., Rept., 1832 ; *id.*, Steph., Col., 1832 ; *id.*, Swains., Moll., 1840 ; *id.*, Ang., Crust., 1851. It is doubtful whether the name has priority in *Reptilia* or in *Coleoptera*, both having appeared in the same year ; if the former, *Prionychus*, Solier, could be adopted, *e. g.*, if *Eryx* be treated as generically distinct from *Cistela*.

Gibbium, Scop., Col., 1777 ; *id.*, Gray, Moll., 1840. —— *Gyrinus*, Linn., Col., 1733 ; *id.*, Shaw, Rept., date ?.

Heledona (*Eledona*), Latr., Col., 1796 ; *id.*, Risso, Moll., 1826.——*Helops*, Fabr., Col., 1775 ; *id.*, Brandt, Pisces, 18— ; *id.*, Dum., *ib.*, 1867.——*Hydaticus*, Leach, Col., 1817 ; *id.*, Schönh., *ib.*, Curc., 1826 (= *Phytobius*, Schönh., 1836).—— *Hydrobius*, Leach, Col., 1817 ; *id.*, Wright, Moll., 1851.——*Hydrochus*, Germ., Col., 1817 ; *id.*, Fall., Dipt., 1823.

Ilyobates, Kr., Col., 1856 ; *id.*, Sars, Crust., 1865.——*Ischnoglossa*, K., Col., 1856 ; *id.*, Sauss., Mamm., 1860.

Lamia, Fabr., Col., 1775 ; *id.*, Risso, Pisces, 1826.——*Lamprosoma*, Kirby, Col., 1817 ; *id.*, Hall, Rept., 1857.——*Lasia*, Wiedem., Dipt., 1824 ; *id.*, Hope, Col., 1840 ; *id.*, Muls., *ib.*, 1846 ; (*Lasius*, Fabr., Hymen., 1804 ; *id.*, Jur., *ib.*, 1807 ; *id.*, Latr., Dipt., 1829 ; *id.*, Motsch., Col., 1845). Crotch (*cf.* Rev. Coccin., p. 90) has already noted that the name *Lasia* cannot be used in *Coleoptera*, and substituted that of Huber, *Subcoccinella* (1841), for it ; the latter name is adopted in the second edition of Dr. Sharp's catalogue (1883).——*Leiosoma*, Steph., Col., 1831 ; *id.*, Chevr., *ib.*, 1837 ; *id.*, Vict., Myr., 1839 ; *id.*, Nic., Arachn., 1855 ; *id.*, Cott., Ech., 1861 ; *id.*, Feld., Lep., 1874 ; (*Leiosomus*, Swains., Pisces, 1839 ; *id.*, Schönh., Col., 1842 ; *Liosoma*, Brandt, Ech., 1835, *id.*, Fitz., Rept., 1843 ; *id.*, Rond., Dipt., 1856). This name has thus been used over and over again ; Stephens, however, has priority.—— *Lissodema*, Curt., Col., 1833 ; *id.*, Blanch., Dipt., 1845.

Mesites, Geoffr., Aves, 1838 ; *id.*, Schönh., Col., 1838 ; *id.*, Jen., Pisces, 1842 ; *id.*, Nik., Ech., 1877. The name *Rhopalomesites* (Woll., 1873) is adopted for this genus in the second edition of Dr. Sharp's catalogue (1883) ; it is doubtful whether the original name takes priority in Aves or *Coleoptera.*——*Metæcus*, Dej. Cat. Col., 1833; *id.*, Gerst., *ib.*, 1855; *id.*, Kröy., Crust., 1839. This genus was not described in *Coleoptera* till 1855, the earlier being a mere catalogue name; it is thus preoccupied in *Crustacea*; if *Metæcus* be retained as generically distinct from *Rhipidiphorus*, a new name is required.——*Microglossa* (*Microglotta*), Kraatz, Col., 1862 (*nec Microglossa*, Fauvel, 1866, = *Nanoglossa*, Fauvel, 1867); *id.*, Sharp, Cat. Brit. Col., 2nd edit., p. 7 (1883); (*Microglossum*, Geoffr., Aves, 1809; *Microglossus*, Wagl., *ib.*, 18—). To avoid confusion, it seems to me preferable to adopt Kraatz's original name, as is done in the Munich Catalogue; *Microglossa*, Fauvel (= *Nanoglossa*, Fauvel), was founded upon two Chilian species.——*Mniophila*, Steph., Col., 1831; *id.*, Boisd., Lep., 1840.——*Mononychus*, Germ., Col., 1824; *id.*, Guér., Hem., 1843.——*Mysia*, Brown, Moll., 1827; *id.*, Gray, Moll., 1840; *id.*, Muls., Col., 1846. This name cannot possibly be retained in *Coleoptera*; if *Mysia* is to be treated as generically distinct from *Coccinella*, a new name is required; it has as yet no synonym in *Coleoptera*.

Nitidula, Fabr., Col., 1775; *id.*, Jerd., Blyth, Aves, 1861.——*Notiophilus*, Dum., Col., 1806; *id.*, Schönh., *ib.*, 1836.

Ocalea, Er., Col., 1837; *id.*, Desv., Dipt., 1863.——*Ochthebius*, Leach, Col., 1817; *id.*, Montr., Hem., 1864.——*Octotemnus*, Mell., Col., 1847; (*Octotemna*, Blanch., *ib.*, 1850).——*Ocypus*, Kirby, Col., 1819; *id.*, Montr., Hem., 1861.——*Odontæus*, Meg., in Dej. Cat. Col., 1821; *id.*, Klug, *ib.*, 1843; (*Odonteus*, Agass., Pisces, 1839). This genus was not described in *Coleoptera* till 1843, a new name, it seems to me, is required for it.——*Orchestes*, Ill., Col., 1807; *id.*, Tschudi, Rept., 1838.

Pachyta, Meg., in Dej. Cat. Col., 1821; *id.*, Serv., *ib.*, 1835; *id.*, Menke, Moll., 1830. This genus was not described in *Coleoptera* till 1835, the name being then already pre-occupied in *Mollusca*; *Argaleus*, Lec. (1850), or *Brachyta*, Fairm. (Gen. Col. Eur.), 1868, might, perhaps, be adopted.——*Pelobius*, Schönh., Col. 1808; *id.*, Fitz., Rept., 1843; *id.*, Greef, Prot., 1870.——*Pelophila*, Dej., Col., 1826; *id.*, Dum., Rept., 1853; (*Pelophilus*, Tschudi, Rept., 1838).——*Phlœobium*, Dej. Cat. Col., 1833; *id.*, Erichs., *ib.*, 1840; (*Phlœobius*, Steph., *ib.*, Curc., 1831; *Phlœobia*, Montr., Hem., 1864).——*Phyllobius*, Schönh., Col., 1824; *id.*, Fitz., Rept., 1843.——*Platypus*, Herbst, Col., 1793; *id.*, Shaw, Mamm., 1799; *id.*, Brehm, Aves, 1831.——*Platyrhinus*, Clairv., Col., 1798; *id.*, Sauss., Mamm., 1860.——*Platystethus*, Mann., Col., 1830; (*Platysthetus*, Er., *ib.*, 1840; *id.*, Günther, Pisces, 1860). The name should stand as written by Mannerheim.——*Platytarsus*, Schönh., Col., Curc., 1840; *id.*, Fairm., *ib.*, Carab., 1850.——*Polydrusus*, Germ., Col., 1817; (*Polydrosus*, Schönh., *ib.*, 1826). This name should stand as *Polydrusus* in *Coleoptera*.

Rhinosimus, Latr., Col., 1802; *id.*, Dum., Rept., 1853.——*Rhizobius* (*Rhyzobius*), Steph., Col., 1832; *id.*, Burm., Hem., 1835; (*Rhizobia*, Dej. Cat. Col., 1833). This name if written as originally adopted by Stephens, *Rhyzobius*, would be less likely to clash with that of Burmeister.

Scymnus, Kug., Col., 1794; *id.*, Cuv., Pisces, 1817.——*Soronia*, Er., Col., 1843; *id.*, Moore, Lep., 1877.——*Symbiotes*, Gerl., Arachn., 1857; *id.*, Redt., Col., 1858 (= *Clemmus*, Hampe, 1850; = *Michochondrus*, Woll., 1854). This name having priority in *Arachnida*, *Clemmus* (Stett. ent. Zeit., 1850, p. 353), not *Clemnus*, as given in the Munich Catalogue, could be adopted.

Tachinus, Grav., Col., 1802 ; (*Tachina*, Meig., Dipt., 1803). Dipterists might perhaps find another name to replace that of *Tachina*.—— *Tetratoma*, Fabr., Col., 1790; *id.*, Fitch, Hem., 1851.—— *Tiresias*, Bory, Polyg., 18— ; *id.*, Steph., Col., 1835 (= *Ctesias*, Steph., 1832). I have not been able to find the date of the publication of Bory de St. Vincent's name ; it almost certainly, however, has priority over that of Stephens ; in any case, Stephens' original name, *Ctesias*, might perhaps be employed to advantage here. Stephens originally wrote *Ctesias*, but subsequently changed it to *Tiresias*, on account of there being a prior *Ctesias* (Hübn., Lep.) ; the latter, however, was unaccompanied by description, and is not quoted by Agassiz and other nomenclators.—— *Trichius*, Fabr., Col., 1775 ; *id.*, Hamm., Verm., 1838.—— *Trichopteryx*, Hübn., Lep., 1816 ; *id.*, Kirby, Col., 1826. *Trichopteryx*, Hübner, being a genus merely in name, without description, the name in *Coleoptera*, of course, takes priority.

Xylophilus, Latr., Col., 1825 ; *id.*, Eschsch., *ib.*, 1829.

From the foregoing list it will be seen that by far the greater majority of these names are entitled to priority in *Coleoptera*. The remainder, however, have no such claim, and for these I have noted the next available name (a few of which have already been adopted by Crotch or Dr. Sharp), or, if none exist, have, with one or two exceptions, suggested a new one.

I have not included many other names which differ only in the terminal *us*, *a*, or *um* ; it seems to me that these names, when they *express precisely the same meaning*, are very objectionable if retained for more than one section of zoology, and worse still if in use in two sections of one Class, *e. g.*, Insecta ; it would be far better to retain the prior name only, and to change the later one. Other names in *Coleoptera* that have been universally in use for half a century at least, though pre-occupied in the same subject, it would certainly be very inadvisable to alter as recently suggested by M. Des Gozis ; such names are *Bruchus*, *Byrrhus*, *Melolontha*, *Mylabris*, *Cistela*, *Scolytus*, *Tritoma*, &c. ; for remarks on this subject see Dr. Sharp's article, Trans. Ent. Soc. Lond., 1886, p. 181.

11, Caldervale Road, Clapham, S.W. :
December 8th, 1886.

MORE ABOUT THE LUMINOUS NEW ZEALAND LARVÆ.

BY C. R. OSTEN-SACKEN, HON. F.E.S.

Since my last notice on this subject (*ante*, p. 133—134), I have received, through the kindness of Mr. Hudson, a specimen of the larva, preserved in spirits. As I anticipated, it belongs to the *Mycetophilidæ*, and its snake-like shape (30 mm. length, and less than two mm. breadth) renders it very probable that it belongs to a very large *Sciophila* or to some genus related to it. The structure of the head and of the parts of the mouth is exactly like the figures given in my paper, "Characters of the larvæ of *Mycetophilidæ*." When I compare the head to that of the larva of *Sciophila*, as figured by me (*l. c.*, fig 7), I find that the palpi are less developed and more like those in figs. 1 and 2. The sutures on the upper-side of the head, which I called "occipital lines," converge towards the posterior margin of the head (somewhat like in fig. 4, f). The posterior margin, of the upper-side, projects in the middle, and has an emargination in the middle of the projection (somewhat like fig. 2, t., only less pronounced). On the under-side of the head, the posterior margin shows an excision which is broader than that in fig. 7. The shell of the head is much softer than that of the *Mycetophilæ* or *Bolitophilæ* which I have seen, brownish-yellow, that is, in consistency and colour exactly like the larvæ of *Sciophila* reared by me.

Mr. Hudson writes that he also discovered a luminous pupa suspended in one of the webs. "It is chiefly remarkable for a long process extending from the dorsal surface of the thorax and branching into several long filaments." Unfortunately, he did not succeed in rearing it. The pupæ of *Sciophila* seen by me were likewise suspended in the webs (see my above-quoted paper, p. 14) ; the long filaments I did not observe. I do not remember seeing my larvæ in the dark; but from their peculiar colouring I should not wonder if they were likewise luminous.

I have already mentioned (*ante*, p. 133) that I have recently reprinted my paper on the larvæ of *Mycetophilidæ*, the original edition having become very scarce. It would afford me great pleasure to send a copy or copies, free of expense, to any one applying to me for them.

Heidelberg, Germany:
February 3rd, 1887.

A NEW SPECIES OF *POLYPHYLLA* FROM JAPAN.

BY GEORGE LEWIS, F.L.S.

POLYPHYLLA LATICOLLIS.

♂. *P. fullonis proxime affinis, at paulo latior; thorace castaneo; clypeo utrinque acute angulato.* *L.* 35 *mill.*

Very closely allied to the European *Polyphylla fullo*, Linn., but may be readily known from it by three or four characters. The head is larger, and the clypeus is more transverse, sometimes with the anterior edge bisinuate, and the angles are produced somewhat acutely, and are not rounded-off as in *fullo*. The frontal ridge is very distinctly elevated, and shows clearly the line where the clypeus begins. The thorax is wider, 1½ mill. in specimens measured, and relatively less constricted anteriorly. The pectination of the antennæ is larger, and each leaflet longer. All these characters are conspicuous, but I fail to see others, except the general colour of the thorax, which is castaneous rather than piceous.

The three males I possess have been captured in the plains between Fujisan and Yokohama, but I have not taken it myself. I am much indebted to Mr. Ota, of Tokio, for a very fine example.

Wimbledon: *February* 12*th*, 1887.

Occurrence of Stigmonota pallifrontana, Z., in England.—While looking over my series of *S. internana*, I lately became aware that one of the ♀ specimens differed from the rest. The insect in question I found, on referring to my notes, had been sent me eight years ago by Mr. W. Thompson, of Stoney Stratford. Indeed, it was the first example of *internana* that I possessed, and as such was placed at the head of my series. Accordingly, I wrote to Mr. Thompson, and, in answer to my queries as to his captures of *internana*, was informed that he only took one or two a season, and then always by sweeping flowers of *Heracleum sphondylium*, but that he had once taken a few in quite another place, upon a heath. He kindly sent me three more to look at, 2 ♀ and 1 ♂, when I at once saw that the second supposed ♀ was another ♂ of the same species as my original type. I expect that the insects Mr. Thompson captures on the heath are the real *internana*, while those he sweeps from the *Heracleum* flowers belong to the species new to us, *pallifrontana*, Z., which may be thus described:—F. w., dull blackish-*brown*; on the inner margin a curved yellowish-white blotch, containing a single dark brown curved line along its centre; on the costa are two yellowish-white spots before, and six beyond, the middle—not eight, as is generally the case,—the two nearest the apex being single, not geminated; face and palpi yellowish-white. From the 5th and 6th costal spots, reckoning from the apex, a fine blueish line curves across the wing to the hind-margin, slightly beyond the anal angle; along the lower edge of the hind-margin is an indistinctly marked coppery line. H. w., dull blackish-brown, alike in both sexes. Thorax, patagia, and abdomen all blackish-brown.

From its nearest allies, *compositella*, F., and *internana*, Gn., it may be thus distinguished:—The *ground colour* of the wings is distinctly *brownish*, not so *black* as in the other two. The *markings* are *dull yellowish-white*, instead of *lustrous silvery*. The *hind-wings* of *both* sexes are alike *brown*, whereas in the ♀ s of both the other species the hind-wings are dark *grey*, and in the ♂ s whitish towards the base. The face and palpi are clear yellowish-white, whence the name.

Moreover, in both its allies the lustrous line is obtusely *angulated* in the middle of the wing, and reaches the anal angle itself as a broadish, pale silvery, perpendicular blotch. Heinemann, p. 185, says that "each division of the blotch on the inner margin sometimes bears traces of a further sub-dividing line, in which cases it becomes difficult to distinguish them from those ♀ specimens of *compositella* in which the dark lines of the pale blotch are less distinctly marked." In the specimens of *pallifrontana* which have come under my notice, I have observed nothing of this (nor, indeed, are such examples of *compositella*, as he here alludes to, very common with us).

In the "Jahrbucher des Vereins für Naturkunde in Nassau," vol. xx, p. 404, the late Dr. Rössler says of this species:—"The larvæ are full-fed at the beginning of August, in green pods of *Astragalus glycyphyllos*." As this plant is by no means a common one, and not likely to be passed unnoticed by a collector, I wrote again to Mr. Thompson, and received the satisfactory reply that at the place where he has taken the imago, there does grow a plant "from two to three feet high, like a large vetch or everlasting pea, which he has never observed anywhere else."

It would be well, therefore, for Micro-Lepidopterists, working in localities where this plant grows, to be on the look out for *pallifrontana* towards the end of May, when the imago makes its appearance, and to examine the pods of the *Astragalus*, in August, for larvæ.—W. Warren, Merton Cottage, Cambridge: *Feb. 14th*, 1887.

Occurrence of another British example of Euzophera oblitella, Z.—Some 13 or 14 years since, I captured in the Isle of Wight an obscure-looking knothorn, which, after it had done duty for some time as a *Homœosoma*, I at last came to the conclusion must be *oblitella*, Z., and Mr. Stainton has lately, I am glad to say, identified it as being that species.

This example was taken on the side of the road leading from Yarmouth to Freshwater, a little distance above Norton corner; and, if my memory serves me right, was at rest on a flower of *Inula dysenterica*, a plant which grows in great profusion thereabouts. I am not aware that the larva is known, but it may be that it feeds in the flowers or stems of *Inula*, as some of its congeners in those of ragwort. The other capture of this insect is recorded in the Entomologist, vol. xii, p. 16, as having been made also on the south-west coast of the Isle of Wight, in 1876. —Id.

Gelechia semidecandrella (n. sp.).—Last autumn but one, whilst inspecting Mr. Stainton's collection of *Tineina*, I was struck by the difference between his specimens of *Gelechia maculiferella* and my own. On arriving at home, I sent my types to him, and he replied that the two series unquestionably represented two distinct species of insects. I have, therefore, named my species, *Gelechia semidecandrella*, from its food plant *Cerastium semidecandrum*. "The imago is very nearly allied to *maculiferella*, but is smaller and narrower winged, the pale hinder fascia is less distinctly angulated, sometimes appearing as two pale spots, which nearly meet in a straight line. The basal portion of the wing is more distinctly marked, with a basal spot on the costa, a spot a little away from the base below the subcostal nervure, and beneath that, slightly posterior, a spot on the inner margin." Such is Mr. Stainton's description of the insect, conveyed to me in a letter, and I feel that I cannot improve on so excellent an analysis, and so publish it in his own words. The larva is yellow, with a black head, and feeds in shoots, flowers and seeds of the food plant in April and May, the imago emerging late in June and July.—I. H. Threlfall, Ashton, Preston: *January 29th*, 1887.

[This new species (*semidecandrella*) is the insect which I bred in 1863 from larvæ found in May on *Cerastium semidecandrum* at Mombach, near Frankfort on the Main, by my friend Herr Anton Schmid. The specimen which I bred was figured in vol. x of the Natural History of the *Tineina* as *G. maculiferella*, for I had not then distinguished it from that species; it was the only bred specimen I possessed, and therefore the finest, and I consequently deemed it the fittest to be figured. Nearly the whole of the letterpress of *G. maculiferella* in vol. x, pp. 154—160, of the Natural History of the *Tineina*, really refers to *semidecandrella.* In the "Geographical Distribution," at p. 160, all refers to *maculiferella*, except the notice of the larva from Mombach, and the "Synonymy," pp. 160—162, refers solely to *maculiferella.* The specimens taken near Vienna, which I received from Herr Mann, occurred, as he informed me, amongst *Cratægus*, showing the same partiality as the species I take at Lewisham, in August, flying along a *hawthorn* hedge.—H. T. S.]

Habits of Hepialus velleda.—The following notice from the pen of Mr. M. Hill, of Little Eaton, near Derby, appeared in the Entomologists' Weekly Intelligencer for July 2nd, 1859 (Vol. vi, p. 107):—"I found, on the 21st June, a female *Hepialus velleda* just emerged from the pupa. I put her into a box with a bit of gauze over to keep her in; and when they were flying at night, I put the box upon the ground amongst the fern, and the males came a great deal faster than I could take them; in fact, I had no less than five or six in my net at once. Their flight is of very short duration, being little over half an hour." The reproduction of this observation may be of interest to the readers of Mr. Robson's notice in our last number (p. 214).—H. T. STAINTON: *February 9th*, 1887.

Occurrence of Tinea misella in corn warehouses.—In the beginning of November, finding that *Tinea granella* was still flying about one of the granaries, I looked through the corn warehouses to see whether anything else was still to be found there. To my great surprise I found *Tinea misella* commonly, sitting on walls and beams in the darker corners, and in charming condition—the largest and darkest specimens I ever saw. As far as I know, but one brood of this species has hitherto been noticed in this country—in July and August—and a November brood was therefore totally unexpected. Moreover, it has not hitherto been noticed as a devourer of corn—though I once found it inhabiting a stable—but in the present case it must, I think, have fed on maize or oats, or possibly cotton-cake. Specimens were to be found until December 10th.—CHAS. G. BARRETT, King's Lynn, Norfolk: *January 24th*, 1887.

Capture of Ptilodontis palpina at sugar.—During my collecting, in the beginning of July, I saw, at the sugar, several moths looking very much like *Xylophasia lithoxylea*, but which were exceedingly shy, taking to flight whenever approached with the light. This seemed strange at the time, as *X. lithoxylea* usually cared for nothing when it had once tasted the mixture. On several occasions I missed taking these suspects through attempting it with a bottle, but on using the net I found *Pt. palpina* in my possession. I cannot say that they were actually eating the syrup, but they were certainly attracted to the spot. Curiously enough I saw all the specimens (about a dozen if all the suspects were *palpina*) at the same tree, a large fir not far from the house, but in a very secluded spot well surrounded by lilac trees, and partially overshadowed by limes. This was one of the places I always sugared in my garden, but it was generally very thinly attended, probably owing to its sheltered position.—SYDNEY T. KLEIN, Clarence Lodge, Willesden: *January 14th*, 1887.

Note on the oviposition and the duration of the egg-stage of Ephemerella ignita.—A friend of mine (Mr. Hawksley) has succeeded in hatching eggs of the "Sherry Spinner" (♀ im.) or "Blue-winged Olive" (♀ subim.), as we call *Ephemerella ignita.* We took the eggs from an imago in July, and the first larva was hatched last week in his fernery.

The ♀ imago of *Ephemerella* carries its eggs differently from all other European May-flies. They issue part at a time, and take the form of a ball, adhering to the under-side of the extremity of her abdomen, and kept steady by means of her setæ, which are turned down underneath the ball. She flies about with the eggs in this position, while the mucus surrounding them hardens, dipping momentarily from time to time in her flight, and alighting now and then upon the water, until the ball becomes detached. This procedure is repeated until all of the eggs are discharged.

I have lately stated in the angling columns of "The Field" that one occasionally finds a subimago carrying the eggs, not in a ball but scattered, between the roots of the wings, on its back; and I have a single example of one not quite freed from the nymph-skin, which has the eggs so disposed.—Frederic M. Halford, 35, Inverness Terrace, Hyde Park, W.: *January 30th*, 1887.

A hibernating Dragon-fly.—Although the weather is very cold, I hunt—not Dragon-*flies*, but *a* Dragon-fly—*Sympycna fusca.* I took several specimens at the end of December, and a friend took one well on in January. I have just seen it in February. It is thus proved that in winters not exceptionally severe, *S. fusca* remains concealed in the heather, and comes out during the slightest sunshine.—René Martin, Le Blanc (Indre), France: *February 10th*, 1887.

[*S. fusca* (one of the *Agrionina*, allied to *Lestes*) is probably the only Dragon-fly known to hibernate. There is no apparent reason why it should not be found in this country, just as is the case with many others; but I think it may be safely said that it does not occur here.—R. McLachlan.]

Periplaneta australasiæ, F., at Belfast.—Early in 1886, Mr. Barrett sent me for determination several examples of this pretty (for a Cockroach) species that had been found, probably in a warehouse, at Belfast: it has already been noticed as occurring in several Continental ports. It is common in Central America, the West Indies, Brazil, &c. I am not aware that it is a common *Australian* insect, notwithstanding its specific name. Fabricius (Ent. Syst., ii, p. 7) simply says "Capta frequens in nave e mari pacifico et regionibus Australasiæ revertente," which, for a Cockroach, means nothing.—R. McLachlan, Lewisham, London: *Dec. 8th*, 1886.

Capture of Bradycellus collaris.—Within the last three years, I have taken a few specimens of *Bradycellus collaris*, Payk., on the Pentland Hills. Its habits are the same as those of *B. similis*, with which it is found in company; but it cannot be said to occur commonly, as it is much scarcer, and more local in its distribution on the hills than *similis*, and requires hard work to find. The first year I found only two specimens; in 1885 I took ten at an elevation of about 1200 feet; and last year I found about two dozen at the much lower level of 700 or 800 feet.—R. F. Logan, Colinton, Midlothian: *February 8th*, 1887.

Sacium pusillum, Gyll., at Birmingham.—On Christmas day last, one of my sons found a small beetle walking on the outside of an orange in my house at Smallheath, Birmingham. Being in some uncertainty as to the species, I sent it to the Rev. A. Matthews, who pronounced it to be *Sacium pusillum.*—W. G. Blatch, 214, Green Lane, Smallheath, Birmingham : *February* 10*th*, 1887.

Bythinus glabratus, Rye, at Sandown, Isle of Wight.—On April 12th, 1884, I captured a *Bythinus*, under a stone, on the side of a cliff at Sandown, Isle of Wight: it was found in company with ants, and with it I took *Trichonyx Maerkelii*: I did not pay much attention to it at the time, but, having lately had occasion to work at the *Pselaphidæ*, I found that it was a specimen of *Bythinus glabratus*; the species is easily recognised by its rufo-testaceous colour, glabrous elytra, and the very long first joint of the antennæ; it was originally taken by Mr. G. R. Waterhouse's sons in August, 1865, in a mossy hollow on the chalk, on Seaford Downs, in company with *Trichonyx Maerkelii*, and a small yellow *Myrmica*. The same locality at Sandown has yielded me such good species as *Atemeles paradoxus*, *Cathormiocerus socius*, *Otiorhynchus ligustici*, &c.—W. W. Fowler, Lincoln: *February* 5*th*, 1887.

Review.

The Butterflies of North America: by W. H. Edwards. Third Series, Part i. Boston and New York: Houghton, Mifflin & Co. London: Trübner & Co. 1887.

True to his promise at the conclusion of the second series of this magnificent work, the author has commenced a *third* series, based on the original lines, which may probably contain sixty plates: and a notable feature is that several plates will be devoted to figures of the eggs of Butterflies, as indicating generic affinity and divergence. The author states that he has never found any difficulty as to obtaining eggs of Butterflies. This first part of the third series concerns varieties (or forms) of *Colias Eurydice*, *Argynnis Nitocris* (a truly magnificent species), and *A. Lais*. The text is as exhaustive, and the plates are as beautiful, as heretofore. *Colias Eurydice*, like many others of the genus, is liable to dimorphism, which in this case appears to be seasonal. Females of the autumnal brood were described by Mr. Henry Edwards under the name *amorphæ*, which refers to the food-plant *(Amorpha californica)*.

The South London Entomological and Natural History Society: *January* 27*th*, 1887: R. South, Esq., F.E.S., Vice-President, in the Chair.

Messrs. Barclay and C. Roberts were elected members.

Mr. J. Jenner Weir exhibited *Nilasera Pirama*, Moore, and *N. Amantes*, Hewt. Also a piece of amber containing five insects. Mr. Billups, living specimens of *Rhagium bifasciatum*, Fab., from Braemar, and contributed notes. Mr. Weir communicated a paper, "Notes on the comparative rarity of *Lepidoptera—Rhopalocera*, once common in the neighbourhood of Lewes." He said that *Aporia cratægi* was very abundant at Keymer in the year 1838, the following year he saw but one, and although he visited the locality for 15 years afterwards, he never saw the species there again; it seemed now to be extinct in the district. He was of opinion that in the earlier decades of the century, a flight of this insect visited Sussex from some part of the continent, and the climate not proving favourable, it had gradually become extinct. It had almost entirely disappeared from the New Forest, where it was at one time very abundant. *Leucophasia sinapis* was a case of an indigenous insect becoming extinct in certain parts of Sussex, and from the weakness of its flight, it was not likely to have immigrated. *Vanessa c-album*, which was now extinct in Sussex, was, at one time, so common in the hop gardens, that the peasants had a local name for it, viz., the "silver bug." After referring to several other species, Mr. Weir, in conclusion, said that as to the cause of the progressive rarity of the species mentioned, he could not hazard a conjecture, but he felt tolerably certain that it had not been brought about by the Entomologists.

At the close of the paper a discussion took place, Mr. Tugwell stated that some years ago he had taken *A. cratægi*, at Herne, near Herne Bay. Mr. Chaney said it was at one time very abundant near Rochester, and, in fact, all over the Hundred of Hoo, but it disappeared about the year 1871. *L. sinapis* used also to be abundant in a wood near Chatham, but after the year 1856 it gradually became scarcer, and about 1858 or 1859, disappeared.

February 10th, 1887: R. ADKIN, Esq., F.E.S., President, in the Chair.

Messrs. H. Collings and L. F. Hill were elected members.

Mr. S. Stevens exhibited a remarkable variety of *Vanessa Atalanta*, L., and a suffused variety of *V. Io*, L. Mr. R. Adkin, *Spilonota incarnatana*, Hb., bred from larvæ found in shoots of *Rosa rubiginosa*, in the heart of Surrey, 40 miles from the coast. Mr. C. A. Briggs, a large number of *Lycæna Corydon*, Fb., including dwarfed forms, blue and brown forms of the female, varieties with the spots absent from the under-side, in excess of the usual number, and running into streaks. Mr. R. South, species of British and Foreign *Lycænidæ*, and contributed notes, calling particular attention to a variety of *L. Corydon* from Asia Minor, which, so far as he could remember, was similar to the varieties exhibited by Mr. Sabine at the Society's meeting on the 7th October last, who had stated that he had seen *L. bellargus* and *L. Corydon in copula.* This, Mr. South said, was quite possible, and he was of opinion that this variety was a hybrid between the two species referred to. Mr. Tutt thought the specimen referred to was simply a local form of *Corydon.* Mr. E. Joy exhibited *Lepidoptera* from the New Forest. Mr. Carrington contributed a paper, "Hibernation and æstivation."—H. W. BARKER, *Hon. Sec.*

ENTOMOLOGICAL SOCIETY OF LONDON: *February 2nd*, 1887.—Dr. D. SHARP, F.Z.S., President, in the Chair.

The President nominated Mr. Robert McLachlan, F.R.S., Mr. Osbert Salvin, M.A., F.R.S., and Mr. Henry T. Stainton, F.R.S., Vice-Presidents during the Session 1887—1888.

The Rev. J. W. Holland, M.A., of Pittsburgh, United States; Dr. F. A. Dixey, M.A., Fellow of Wadham College, Oxford; Mr. C. J. Gahan, M.A., of Brompton, S.W.; and Mr. Sydney Klein, F.R.A.S., of Willesden, N.W.; were elected Fellows.

Mr. P. Crowley exhibited a new species of *Synchloë (S. Johnstoni)* from Kilimanjaro; also, for comparison, specimens of *Synchloë mesentina* and *S. hellica*, which the new species closely resembled.

Mr. W. White exhibited a number of preserved larvæ of European *Lepidoptera* in various stages of growth (including nine examples each of *Saturnia carpini* and *Deilephila euphorbiæ*), illustrating the gradual development of the markings and colours, as explained by Prof. Weismann, in his "Studies in the Theory of Descent."

Mr. Gervase F. Mathew exhibited a variety of a female of *Lycæna Telicanus*, from the neighbourhoood of Gallipoli, Turkey; also some specimens of a *Lycæna* from Vigo, believed to be varieties of *Lycæna Baton*, but differing from the type in being much larger and darker. He further exhibited several examples of a *Leucophasia* from Vigo, which appeared to be identical with *L. æstiva*, Staud.

Mr. Porritt exhibited, on behalf of Mr. N. F. Dobree, a series of a remarkable red form of *Tæniocampa gracilis*, bred last season from larvæ collected in Hampshire.

Mr. Eland Shaw exhibited specimens of *Pachytylus cinerascens*, Fab., *Mecostethus grossus*, Linné, and *Gryllus flavipes*, Gmel., and read a "Note on the Identity of *Gryllus (Locusta) flavipes*, Gmel."

The Secretary read a communication from Prof. Riley, of Washington, on the subject of the "Australian Bug" *(Icerya Purchasi)*. It was stated that the insect had of late years become very destructive to various trees and shrubs in California, into which country, as well as into New Zealand and Cape Colony, it had been introduced from Australia, where it was believed to be indigenous; but on this point further evidence was asked for.

The Rev. T. A. Marshall communicated "A Monograph of the British Braconidæ," Part 2, being a continuation from Part 1 of the "Transactions" for 1885.

Mr. Francis P. Pascoe read a paper entitled "Descriptions of some new species of *Brachycerus*."

Mr. Francis Galton, F.R.S., read a paper on "Pedigree Moth-breeding as a means of verifying certain important Constants in the General Theory of Heredity." In this paper Mr. Galton suggested the institution of a system of experimental breedings, to be continued for several years, with the object of procuring evidence as to the precise measure of the diminution of the rate at which a divergence from the average of the race proceeds in successive generations of continually selected animals. Mr. Frederic Merrifield read a paper (by way of appendix to Mr. Galton's paper) entitled "A proposed method of breeding *Selenia illustraria*, with the object of obtaining data for Mr. Galton." Mr. McLachlan said he considered the fact that *S. illustraria* was dimorphic an objection to its selection for the experiments proposed by Mr. Galton, and he suggested that the Common Silkworm Moth, or some other large Bombyces, would be more suitable for Mr. Galton's purposes. Prof. Meldola called attention to some observations on *Selenia illustraria* by Dr. Knaggs in vol. iii of the Ent. Mo. Mag., which had some bearing on the projected experiments; and he remarked that although, for some reasons, the species selected was well adapted for testing Mr. Galton's conclusions, he believed that the fact of the moth being seasonally dimorphic was likely to introduce disturbing elements into the experiments which might influence the results.

The discussion was continued by Messrs. Sharp, Baly, Kirby, White, Klein, Porritt, Dunning, Waterhosue, Bates, Merrifield, Galton, and others.—H. Goss, *Hon. Secretary.*

NOTE ON SOME BRITISH *COCCIDÆ* (No. 6).

BY J. W. DOUGLAS, F.E.S.

ASPIDIOTUS OSTREÆFORMIS.

Aspidiotus ostreæformis, Curt., Gard. Chron., 1843, p. 805 and fig.

Nec Diaspis ostreæformis, Sign., Ess. Cochin., p. 121, pl. v, fig. 4; *nec D. ostreæformis*, Comst., "Report," 1880, p. 311, pl. xv, fig. 4, and "Report," 1883, p. 94, No. 65. ? *Diaspis ostreæformis*, Goethe, Jahrbuch d. nass. Ver. für Naturkunde, 1884, p. 114, pl. i, fig. 1—5.

♀ scale round, 1—1·5 mm. in diameter, slightly convex, greyish-black; exuviæ nearly central, unicolorous, ashy-grey or usually dark yellow or rust colour; the surface rough or striate, often with a grey efflorescence (the largest were abnormally swollen and parasitized).

♂ scale much smaller, oval; exuviæ more lateral.

♀ adult: the last abdominal segment with five groups of spinnerets, anterior 3—5, anterior-lateral each 6—9, posterior-lateral each 6—10; the margin with two median lobes, followed on each side by two deep emarginations, between which is a spinose hair, and but one further on towards the next segment, but these are not always present or apparent.

♂ imago ochreous, thorax with a deep semi-oval depression, with a black transverse streak at the base between the wings; wings large, broad, whitish; antennæ hairy, stout, almost as long as the body, apparently 8-jointed, but having also two very minute, intermediate, as adjuncts.

Curtis described his *Aspidiotus ostreæformis* thus:—

"On the bark of a pear tree, covered with scurfy scales, exactly the colour of the bark, mostly orbicular, but a few oval; dark ashy-grey, a little convex, slightly wrinkled, margin membranous and whitish, and between it and the centre a raised semi-transparent spot of an ochreous or rusty colour; when the scale is removed a whitish or greyish spot is apparent upon the bark, on this the ♀ rests; inside of scale hollow like a shallow cup, at the top of which the yellowish horny spot very distinct; outer margin of scale broad, whitish, formed of the membrane which attaches it to the bark.

"The ♀ orbicular heart-shaped, fleshy, fat, shining, yellowish-white, with a few short hairs scattered over the sides; tail distinct, quite yellow, with a suture beneath; neither legs nor antennæ, but on the under-side, a minute nipple, from which issued the rostrum of considerable length.

"Male under an oval scale; bright ochreous; head small, eyes black, antennæ nearly as long as the animal, hairy, stout, 8-jointed; thorax large, ovate, collar distinct, a black transverse stripe between the wings; scutellum large, semi-ovate. Wings ample, whitish, rounded; halteres of two joints ending in a curved bristle."

Signoret places *Aspidiotus ostreæformis*, Curtis, as a *Diaspis*, saying (p. 122):—

"The scales of the ♂ are a little longer than those of the ♀, brown, with the exuviæ on one side; but afterwards (p. 441) he says this indication is erroneous, and that "he has always found the ♂ scale very small, white, carinated, with the exuviæ at the extremity, as in all other scales of the group."

Of the ♀ he says:—"There are five groups of spinnerets; median 10—12, superior lateral 12—13, inferior lateral 13—14. The margin has two median trilobed lobes; on each side some small emarginations, and beyond, as far as the preceding segments, 9—10 spines." In our species the number of spinnerets is much less, the median lobes are not trilobed, and the marginal spines are certainly not 9—10, only two or three.

Comstock described his *Diaspis ostreæformis* from materials received from Dr. Signoret, and therefore it is the same as Dr. Signoret's.

Goethe's *Diaspis ostreæformis* appears, on the whole, to be the *Aspidiotus ostreæformis* of Curtis, for he says :—"I observe that the scales of the ♂ are not essentially different from those of the ♀ ;" therefore, they are not those of a *Diaspis*. He makes out 9 joints in the antennæ of the ♂, but, as before stated, this may only be a matter of observation. The doubt about the identity of his species with that of Curtis arises from his statement of the number of spinnerets in the respective groups being—"middle 10—12, upper lateral 12—13, lower lateral 13—14,"—being the same as given by Signoret for his species, but not the same as found in ours. Mr. G. S. Saunders prepared a number of specimens that I had collected from plum, apple, pear and cherry trees; he found they all exhibited exactly the same characters, and the number of spinnerets, &c., to be as I have stated above.

About the middle of March last I noticed that the trunk of a plum tree had on the bark numerous white spots about a millimètre in diameter, and on examination I saw that they were the ventral skins of old scales of an *Aspidiotus* that had fallen off and left these affixed. Looking more closely I saw other scales of a previous generation still remaining, but they were loose and came off with a touch; and there were also numerous recent scales adjacent, either in batches or single, tightly adherent. Other scales of the same sort were abundant on apple, pear and cherry trees. From some that I removed, still attached to pieces of the bark, and put into gauze-covered glasses indoors, I obtained a few males early in May. My description, made at the time, agreed so closely with that of Curtis's *Aspidiotus ostreæformis*, that I quite believed I had found that species; but there was just room for a doubt, because, although I diligently searched, I could not detect the "very small, white, carinated scale" which Signoret attributes to the ♂ of this species, and which gives the character of *Diaspis*. However, I eventually came to the conclusion that Signoret's species was not the same as that of Curtis, as he had deemed; but in order to elucidate the matter, I sent some examples to Professor Comstock, of Cornell University, Ithaca, New York, the State Entomologist, than whom no one has had greater experience in the examination of *Diaspina*, and he having very kindly devoted a considerable attention to them, writes thus :—

"I think now that the species described by Curtis is an *Aspidiotus*, and I believe that the species we are studying is the one. The description agrees well with this species, remarkably well for one written at that time; even the hairs on the sides of the female figured by Curtis are represented by tubular spinnerets in the position indicated. Signoret evidently made a mistake in his determination; fortunately the two insects belong to different genera, so that there need be no change of specific names. I am very glad to have this matter cleared up, for I have never been satisfied with Signoret's determination.

"*Aspidiotus ostreæformis*, Curtis (as we now understand it), resembles my *A. juglans-regiæ* very closely; I expect that my name will prove to be a synonym. The scales on apple, cherry and locust (see my report for 1880, p. 301) are smaller than those I found in California on English walnut, and are darker, and there are very slight differences in the margin of the last segment of the female; but I am inclined to believe that the form on walnut is a climatic or phytophagic variety of *A. ostreæformis*."

This opinion of one who is so good an authority is, I think, very satisfactory.

PARLATORIA PROTEUS.

Aspidiotus Proteus, Curt., Gardeners' Chronicle, 1843, p. 676 and fig.

Parlatoria orbicularis, Targ.-Tozz. Cat., 42 (1868).

Parlatoria Proteus, Sign., Ess. Cochin., 132, pl. 5, fig. 5 (1869); Comst., Report, 1883, p. 114, 96, pl. ii, fig. 7, 7*a*, pl. iv, fig. 3.

The genus *Parlatoria*, one of the most remarkable of the subfamily *Diaspina*, primarily indicated by Targioni-Tozzetti for two species, *Aspid. Proteus*, Curt., and *Coccus ziziphi*, Lucas, was first characterized by Signoret from the same species in part 5 of his "Essai sur les Cochinelles," published in the "Annales" of the Entomological Society of France, 1869, as follows:—

"♀. Scale long, narrow at the base, then abruptly enlarged, exuviæ rounded-oval. Only four groups of spinnerets. The margin of the anal segment as if crenulated, and having some plate-like scales in each of the emarginations. On the surface, near the margin, two rows of isolated spinnerets. ♂ scales of the same colour as that of the ♀, and much smaller."

The most important generic character is the structure of the outer margin of the last segment of the abdomen of the female, namely, three large lobes, and normally, a fourth smaller, on each side of the median, each bearing a basal spine, separated by deep emarginations, in each of which are flat plates, oblong, parallel-sided, as long as the lobes, their extremity having an acicular fringe, viz., two between the median lobes, two between the 1st and 2nd, and three between the 2nd and 3rd; the bases of the lobes connected by crescent-shaped thickenings of the integument. Between the 3rd and 4th lobes three plates varying in form. On the lateral margins of the three preceding segments, as well as some on the margin of the last beyond the lobes, are fringed plates, usually palmate, but varying in form and number from five to ten.

In *P. Proteus* the ♀ scale, normally elongate, but often short, flat, broad-oval, pale yellowish-brown, the first exuviæ rounded-oval, the 2nd long-oval and conspicuously large, the 3rd smaller. Length, 1·5—2 mm.

♂ scale narrow, linear, coloured like the ♀, but the exuviæ at the base black; the middle not keeled, but depressed, or with a longitudinal fissure when the imago has come out. Length, 1 mm.

♀ adult: only three marginal lobes on the last segment, the 4th being replaced by a fringed plate.

♂ imago clear reddish-yellow, wings white with red nerves (Signoret).

In May last Mr. P. Cameron sent me some leaves of *Dendrobium* and *Oncidium* having on the under-side, along the midrib, numerous scales, which proved to be those of the ♀ of *Parlatoria Proteus*; on the same leaves were also a few of the ♂ scales, situated either singly or in small batches, but empty.

Var. *crotonis.*—At the same time Mr. Cameron sent me some leaves of a *Croton*, to which were attached, on the under-side, along the midrib and under the incurved edges, many scales exactly like the ♀ of *P. Proteus*. But examination of the insect beneath, made by Mr. G. S. Saunders, showed a divergent structure of the margin of the last segment which approximated that of *P. Pergandii*, and this being a species described by Prof. Comstock, and of which there was a *quasi* variety—*camelliæ*— (Report, 1883, p. 114), I thought it best to send him some of these scales. He says respecting them:—

> "The *Parlatoria* on *Croton* approaches *P. Pergandii* in having the 4th and 5th lobes, but these are very small. Laterad of the 5th lobe there are fewer plates than in either of the species described. The scale resembles that of *P. Proteus*."

In December I received from Mr. Sowerby, Royal Botanic Society's Gardens, Regent's Park, leaves of three species of *Croton* on which these scales were abundant.

On plate iv of his "Report" for 1883, Professor Comstock has figured the margin of the last segment of the ♀ of the three known species of *Parlatoria* (including the var. *camelliæ*) showing the difference of structure at one view.

THE GENUS LEPIDOSAPHES, SHIMER.

Only quite recently there has come under my notice a Note by Dr. Franz Löw, in the "Verhandl. der k. k. zool.-botan. Gesells. Wien," 1882, p. 522, to the effect that the genus *Lepidosaphes*, Shimer, founded on *Aspidiotus pomorum*, Bouché, published in vol. i of the "Transactions of the American Entomological Society," 1868, has priority over Signoret's genus *Mytilaspis*, characterized in part 6 of his

"Essai sur les Cochinelles," which was presented to the Société entomologique de France, 25th March, 1868, and published in the Society's "Annales," Tome X, p. 91. Signoret (*l. c.*) notices Shimer's work thus: "Tout dernièrement M. Shimer a créé pour ces espèces un nouveau genre qu'il appelle *Lepidosaphes*: nous aurions adopté volontiers ce nom, si déjà M. Targioni et nous-même n'avions *publié* l'*Aspid. conchiformis* sous le nom générique de *Mytilaspis*, nom qui lui est très-bien approprié par sa ressemblance avec une moule." Targioni, in his Memoir, p. 44, also refers to *Lepidosaphes*, Shimer, but only as a synonym of *Mytilaspis.*

Not being able at that time to put my hand upon Shimer's paper, and being then in the act of writing to Professor Comstock, I asked his opinion. Before I had his answer I had read Dr. Shimer's article, and a very interesting account it is of the structure and natural history of *Aspidiotus pomorum*, Bouché (erroneously cited as *Coccus conchiformis*, Gmel.), from the newly-hatched larva to the egg-laying female; and it is noteworthy that with the most careful continuous observation he did not see a male in any condition, this being confirmatory of all other observers. Shimer does not appear to have investigated the structure or metamorphoses of any other species of *Diaspina*, or he would have seen that most of the characters he puts as generic belong also to most of the Sub-family. But the consideration of any question of dubious priority of publication is rendered superfluous by the facts that in the definition of *Lepidosaphes* some important generic specialities of the insect, and of other species naturally associated with it (*e. g.*, the peculiar form of the scale, &c.), are omitted, and one, "male unknown"—a specific character only—is inserted; therefore, the genus is not equivalent to the more fully characterized *Mytilaspis*, and cannot be adopted in its place. The Family *Lepidosaphidæ*, sought to be established on the same narrow grounds as the genus, merges into *Diaspis* (now *Diaspina*), a division made by Costa in 1827.

Subsequently, I received Professor Comstock's reply, as follows, his conclusions and mine being practically the same:—"It is quite probable that the name *Lepidosaphes* was published before *Mytilaspis*, but I think that the former name has no claim to recognition. Shimer made the (to him) wonderful discovery that the scale of the apple tree bark-louse was distinct from the body, and that the tarsi of the larvæ bore digituli. These characters, together with the supposed absence of tarsal claws, he thought of sufficient importance to establish a new genus, and to make it the type of a new family. This is the gist of two pages of small print. If *Lepidosaphes* stands for anything, it includes the whole of the scale-bearing *Coccidæ, i. e.*, the *Diaspina*. The name *Diaspis* was proposed for this group by Costa in 1827. *Lepidosaphes* is therefore a synonym of the much older name *Diaspis*, and had no claim to recognition in the subsequent division of the genus."

ADDENDUM.

Pulvinaria camellicola (*cf.* vol. xxii, p. 159). I have this from Kew Gardens on the Orchids *Oncidium papilio* and *Calanthe natalensis.*

8, Beaufort Gardens, Lewisham:
February, 1887.

SOME NOTES ON THE COMPARATIVE STUDY OF BRITISH AND CONTINENTAL *RHOPALOCERA*.

BY W. F. DE V. KANE, M.A., F.E.S.

The scientific British entomologist is at a considerable disadvantage in studying the problems of variation presented by our insular entomological fauna, for want of good public collections of Continental insects. I purpose to indicate in this paper some lines of enquiry, to which a comparison of our British *Rhopalocera* with those of the Continent invites consideration.

Mr. Wallace, in his "Island Life," has directed attention to morphological phenomena developed under insular conditions amongst birds. Mr. Wollaston, in his "Insecta Maderensia," and other works, pursued similar enquiries amongst *Coleoptera*. Both of these eminent naturalists shew that frequently the most surprising and interesting results arise through the segregation of a comparatively limited number of individuals from the large mass of their fellows on Continental areas. This isolation begets variation, for, as Darwin states, "Intercrossing plays a very important part in Nature in keeping the individuals of the same species, or of the same variety, true and uniform in character." Since isolation, therefore, plays such an important part in the formation or encouragement of new varieties and species, the comparison of British varieties among each other, a subject which has attracted much attention of late, is quite subsidiary in importance to their relation to their Continental analogues. It is, therefore, full time to raise a voice of warning and protest against some dangers that now threaten. The competition amongst British entomologists has latterly become so keen, that an insect with a new pattern (for, unfortunately, it is to be feared that varieties are frequently valued for little else) fetches an extraordinary price at auction rooms. Their money value having been much enhanced, it is not surprising that they should be manufactured to meet the demand. And another element of doubt and difficulty has also been added by the sale of Continental specimens to amateurs desirous of completing their English collections. Take, for instance, *Syricthus malvæ* (*alveolus*, H.), our sole representative of that genus among the *Hesperiidæ* (and for that reason a most interesting insect, considering what a variable and numerous group of Continental cousins it has). Who can tell whether the specimens of *ab. Taras* that are to be found in most English cabinets are all truly British?

Before any conclusions are attempted to be drawn from the variations presented by this species in England, it is primarily necessary to have a numerous series, the authenticity of which is past question.

And who can say how far the British specimens of several formerly rare species of *Lepidoptera* latterly offered in considerable numbers for exchange or sale, are the descendants of an ancient British stock, or merely the great grandchildren of a modern experiment at acclimatization? Unless a resolute and combined effort is made to check these and other modes of tampering with our indigenous fauna, it is possible that in a short time, lessons which ages of isolation have accumulated for our instruction, will be obliterated for ever.

But there are other natural causes which bring about modifications in pattern and size besides the isolation which the ancient geological disruption of Great Britain from the rest of Europe has effected. Of these we may instance the effect of climate as one of the most important, and since ours is confessedly peculiar, we have a second test to apply when instigating a comparison between our own and Continental examples. One form of climatal influence also is that which depends on altitude. And this has been found to affect both botanical and zoological organisms in a similar manner as latitude. Higher latitude in fact corresponds to increased altitude. I will not, however, pursue the subject further in its general bearings, but will take up a few points worth noting in a cursory survey of our *Diurni*.

The first butterfly in the British list is *Papilio Machaon*. This, though said formerly to have existed in many places in England, is now closely restricted to one or two localities, and, therefore, if it survives, is the more likely to vary from the Continental type. The genus to which it belongs presents aberrant tendencies in the proportionate breadth of the black bands, in the length of the "tail" on the hind-wings, and in the warmth or pallor of the yellow ground-colour. The size of the eye spots at the anal angle of the hind-wing also varies. I do not know whether British specimens exist illustrative of similar tendencies. The Corsican species, *P. Hospiton*, appears to have become specialized through isolation, and to be a result of the first two tendencies in *Machaon*. In the *Pieridæ*, *P. napi*, deserves careful and systematic attention at the hands of British entomologists. Not only does it display a dimorphic form, differing in the two seasons of emergence, but occasionally in Ireland, and doubtless elsewhere the ♀ presents a dingy appearance, with strongly shaded ray-markings on the under-side, that reminds one much of the Alpine and Scandinavian variety *bryoniæ*. This form, and the pale spring form of *Vanessa levana* are considered by some to be surviving witnesses of the effects of the Glacial Epoch. As the Scotch and Irish faunæ seem to be strongly Scandinavian in their features, it is probable that in these countries interesting varieties of the above *Pieris* may turn up.

Of the genus *Euchlöe*, *cardamines* is our only representative. Among other species the white of the under-side of the hind-wings turns silvery in hot southern districts. A similar phenomenon is also displayed in the genus *Cœnonympha*. *Euchlöe Eupheno* frequently presents very diminutive specimens flying in the same locality with those of the normal size ; and hermaphrodites occur not very rarely. It is also noticeable that the orange of *cardamines* sometimes extends so far as to embrace the discoidal spot.

Leucophasia sinapis varies in the shape of the apical blotch of the ♂ in spring and summer, while in the ♀ it is partially or entirely absent. Another aberration presents an entirely white under-side of the hind-wings.

Of our two species of *Colias*, *Edusa* shows a bleached ♀ form, which, like the pale *Vanessa levana* of springtime, and the Alpine variety of *Pieris napi*, is said to bear testimony to a former sub-arctic climate. Several other European species of *Colias* present a similar bleached ♀ dimorphism, as well as some species from Africa and America. In *C. Hyale*, ♀, the bleached form is the usual one, while it is said that a more strongly coloured aberration has been also observed, but very rarely. *C. Palæno* likewise has a pale ♀ usually, and only occasionally a form approaching the ♂ coloration. The ordinary ♀ of *C. Palæno* is very pale, but a more highly coloured aberration also occurs.

The two European species of *Gonopteryx* are extremely stable, and this renders more interesting the record by Curtis, in his "British Entomology," of an English *G. rhamni* with an orange flush on the fore-wings. Had the example been a ♂, one would have concluded that some similar aberration had been the ancestor of *G. Cleopatra*, with its matchless orange-flushed fore-wings. The females of the two species are almost indistinguishable.

When we arrive at the *Lycænidæ*, we find a wide field for interesting investigation, and one which is being illustrated, as far as British examples are concerned, in some valuable papers by Mr. South.

The genus *Lycæna* comprehends a multitude of species on the Continent, many of which closely approximate, while their varieties often present very analagous characters. The females of two or more species are often almost indistinguishable, although the males are strongly characterized. *L. Icarus*, for example, has usually a dull brown ♀, extremely like that of *bellargus (Adonis)* ; but sometimes in England, and very frequently in Ireland, it is almost as blue as the ♂, but with a lovely border of large orange lunules on both wings. It would be of much interest to ascertain in what districts this form crops up, as it possibly depends on climatic influence. An exactly parallel ♀ dimorphism occurs on the Continent with *L. bellargus* (*Adonis*), (*ab.* ♀ *Ceronus*), and this I think exemplifies the rule pointed out by Darwin, that kindred species often exhibit homologous variations. The ♂ *Icarus* also occasionally approximates to its cousin *bellargus (Adonis)*, in having almost as brilliant an azure blue, and I have seen specimens in which the rudiments of a chequered fringe existed, and not very rarely eye spots are to be found on the border of the hind-wings. Mr. Jenner Weir has called attention to the increased breadth of the black apex of the fore-wing of *L. Argiolus* ♀ in its second emergence. In the south of Europe this character seems constant, suggesting a climatic origin. We see similar phenomena displayed in many other *Rhopalocera*, whose summer form in North and Central Europe is the only one known in the extreme south, and it has been stated by a trustworthy authority, that in excessively hot summers, characters usually peculiar to certain butterflies in the most southern European latitudes have been developed in Central Europe.

These and similar facts are of very great interest, and should be carefully observed and noted. Among other details worthy of attention are the proportional development of "tails" at the anal angle of the hind-wings of *Polyommatus Phlœas*, and the genus *Thecla*. It seems exceedingly probable that coincident with the attainment of the most vigorous conditions under the sunny southern skies, these appendages are prolonged. Thus we find Italian specimens of *P. Phlœas* (which in England possesses only rudimentary tails) adorned with well-marked filaments of this description. In tropical and sub-tropical countries some species of *Lycœnidœ* have them of prodigious length, and there seems some reason to think that these adornments have been developed from tail-less ancestors, for in some cases the ♂ alone is tailed.

Certain of the genus *Thecla* are characterized in the ♂ by a peculiar scaleless membranous patch at the extremity of the discoidal cellule of the fore-wing. This peculiarity has suggested a subdivision of the genus. Occasionally, however, examples occur in which this mark is almost wholly absent. Such aberrations should be looked for. There are numerous traits of variation noticeable among well-defined species of other genera, the occurrence of which point to convergent lines of ancestry. Take, for instance, the apical ocellus common to most of the *Satyridœ*. In *E. Janira* we find a more or less double ocellus with a single pupil usually, but I possess examples, chiefly ♀, in which this apical ocellus is bi-pupilled; just like the species *Tithonus*, *Ida*, and *Pasiphaë*, which otherwise are abundantly distinct; the females, however, of the first two being closely approximate. I have also seen a ♂ *Janira* with two ante-marginal spots on the fore-wing, besides the ocellus at apex.

The *Erebiœ* constitute, on the European Continent, a most interesting group of variable Satyrs. The true *E. Epiphron* is said to be only found here in its degenerate form (or is it rather the pristine type?) *Cassiope*. It may be possible, however, that examples of the type may also occur. It is noteworthy that very interesting phases of oromorphic and pediomorphic variation are shown among this genus, the colour and markings being affected by altitude, and also in some cases the contour of the wings! Here, again, sexual divergences seem to suggest some indication as to the genesis of species, the females of several species retaining a rounded contour of wing, which, in one or two species, is common to both sexes occasionally at great elevations. Of *Cœnonympha* likewise we have but two representatives in Great Britain, and the larger of the two is notably variable. Its pale non-ocellated form seems to occur as an aberration with the type in Scotland and elsewhere, but I do not know if it is found alone, as a local variety, in any part of the United Kingdom. Between it and the dark brown Yorkshire *Typhon* with numerous and large ocelli there exists every grade of pattern. In *C. Arcanius*, and in a less degree in one or two other species, we find an exactly parallel variation to that of *Typhon*, in regard to the development of the ocelli and band of under-side of hind-wings.

The foregoing observations will serve to show that the British entomologist who collects varieties merely for the sake of their beauty or unique character, is neglecting a branch of the subject which is of extreme interest.

A paper by Mr. Dobree, in the "Entomologist" of February, shows what interesting questions offer themselves to our notice on a careful comparison of British and Continental *Heterocera*. But few, however, have private collections of this kind, and until adequate provision is made in the public museums, little advance will be possible.

Kingstown, Ireland:
February, 1887.

DESCRIPTION OF THE LARVA OF *SCOPARIA RESINEA*.

BY G. T. PORRITT, F.L.S.

On the 12th May last, I received from Mr. Eustace R. Bankes a few larvæ of a *Scoparia*, which proved to be this species, and which he had found feeding under lichens and moss growing on ash trees at Corfe Castle.

Length, half to five-eighths of an inch, and of the usual *Scoparia* form: body cylindrical, of moderate bulk, and attenuated slightly at the extremities. Head, with the frontal and anal plates highly polished, and the large round tubercles also glossy: the tubercles, together with the deeply cut segmental divisions, and a slight transverse ridge on each segment, give to the skin a wrinkled appearance.

The ground-colour is a sort of greenish-yellow, very similar indeed to the colour of the lichens on which the larva feeds; head, plates, and tubercles very dark bronzy-brown; the front pair of tubercles on each segment are larger, and closer together than the hind pair; and in young specimens the front and back tubercles on each side appear to join, and so form distinct, dark, bronze, oblique streaks. When the larva is crawling, the dark green alimentary vessel shows through at the segmental divisions, as the dorsal stripe, but there are no perceptible sub-dorsal or spiracular lines.

Ventral surface and prolegs of the same colour as the ground of the dorsal area, the legs ringed with darker.

I found the first imago out on June 30th, and others appeared at intervals afterwards. During the second week in July Mr. Bankes wrote me my specimens had appeared well up to time, as the species was then common with him on *apple* trees in an orchard.

Huddersfield: *March 3rd*, 1887.

A NEW GENUS OF *PIERINÆ* ALLIED TO *APPIAS*.

BY ARTHUR G. BUTLER, F.L.S., F.Z.S., &c.

Whilst re-arranging our collection of *Pierinæ* last year, I carefully re-examined the structure of the whole of the species, and thereby discovered that amongst the forms previously associated under the generic name of *Appias* (= *Tachyris*, Wallace), characterized by the males having a brush of hairs between the anal claspers, there were a number of species in which the females also had the last segment of the abdomen furnished with a similar brush; the species of the latter group are confined to Tropical America, Madagascar, and Southern Africa, and to them I give the name of *Glutophrissa*: though in other respects so like *Appias*, that it is hardly worth while to characterize the genus at length, I believe it to be a perfectly natural group, the whole of the species of which exhibit considerable uniformity in form and pattern.

GLUTOPHRISSA, *gen. nov.*

Affine Appiadi, *abdomen autem feminarum subtus penicillo curvato instructum, vena quoque alarum anticarum radialis superior cellulæ discoidali plus approximata. Gen. typ.*, G. Poeyi.

The named species in the Museum collection stand as follows:—

1. *Glutophrissa Poeyi*, Butl. St. Domingo, Honduras, Quito.
2. „ *Molpadia*, Hübn. Jamaica.
3. „ *Margarita*, Hübn. Panamá.
4. „ *albunea*, Dalm. Brazil (Rio Janeiro).
5. „ *Drusilla*, Godart. Honduras.
6. „ *Castalia*, Fabric. Brazil.
7. „ *flavida*, ♀, Mabille. Madagascar.
8. „ *Saba* (♂ = *matuta*), Fabr. Ashanti, Old Calabar, S. Leone.
9. „ *Malatha*, Boisd. Madagascar.

Allied to the last two species is one from Natal, which appears not to have been named, but which I believe to be a constant type, perfectly distinct from the Malagasy and West Coast forms; at any rate, it would be surprising to find that a southern form exhibited great variation in pattern, whilst its western representative remained absolutely constant in this respect; I have seen a considerable number of examples of *G. Saba* from Old Calabar, and the differences between them were quite insignificant. Several mistakes have been made in sexing *G. Saba*, its true male is the *Pieris matuta* of Doubleday, which comes in every collection with it. *P. orbona* (which has been supposed to be its male by Messrs. Mabille, Saalmüller, and others) is a *Pinacopteryx*, close to *P. Larima* and *P. alba*, and, doubtless, has a female of the *Gonoris rapæ* type, like all the other species of *Pinacopteryx*.

British Museum:
February, 1887.

Early appearance of Anthophora pilipes, Fab.—On the 25th of this month I saw a male of this bee flying round the yellow crocus in a garden in Wotton-under-Edge. On the 27th I saw several of the same sex on the same flowers, and boxed one for the sake of the early date. Last year the first seen was on April 3rd, which is late. The usual time of appearance here is about the middle of March. No doubt, should the present sunny weather continue, it will be out in numbers in a few days.—R. C. L. PERKINS, Lisle House, Wotton-under-Edge: *February 28th*, 1887.

SUPPLEMENT TO ANNOTATED LIST OF BRITISH *ANTHOMYIIDÆ.*

BY R. H. MEADE.

(*Continued from page* 181).

LIMNOPHORA, Desv.

L. ALBIFRONS, Rond., *non* Zett.

This species differs from all the other true *Limnophoræ* with which I am acquainted by having yellow tibiæ. Rondani knew only the male, I have had the pleasure of finding the female, which agrees very closely with Rondani's description, but differs in a few points, which I will now give. In the male only the four posterior tibiæ are yellow, the front ones being black with yellow bases. In the female all the tibiæ are entirely of a clear yellow colour. In the male Rondani says that the thorax is grey and immaculate (*unicoloria*) ; in the female it is grey, very pale in front and on the sides, and marked on the dorsum with several short black stripes or marks. The abdomen of the female, like the male, has each segment marked by two large spots, which in my specimen are subquadrate in form.

The head in the female has the eyes separated by a space which occupies about one-third of the width of the head, it is deep black, quite straight on the sides, and has a spot on the forehead with a stripe on each side white, like the face.

Rondani does not give the size of the male ; my female specimen measures about 4 mm. in length.

I captured a single female of this well-marked and interesting species at Conishead Priory, near Ulverston, Lancashire, on August 2nd, 1886.

L. SOLITARIA, Zett.

This species was placed in my list in the genus *Cænosia*, but upon close examination I find that it possesses the true characters of a *Limnophora* ; thus, the eyes of the male, though rather widely separated, are still nearer together than in the true *Cænosiæ*, the space between them not measuring more than a fourth or a fifth of the width of the head, while in the *Cænosiæ* it will measure at least a third ; besides this, there is another and more important character of distinction, for the inner sides of the eyes in the males are convex in this species, as in other *Limnophoræ*, being nearer together in the centre than they are above and below ; while in the *Cænosiæ* they are straight, leaving the intraocular space of an even width throughout in the males, as is the case in most female *Anthomyiidæ*.

HYDROTÆA, Desv.

H. SIMILIS, *sp. n.*

Mas, niger nitidus ; thorax in fronte breviter albo striatus ; abdomen albidum-pallinosum, parce fuso-tessellatum, linea longitudinali tenui nigra ; oculi nudi subcontigui ; *alæ basibus marginibusque anticis fuscæ, venis longitudinalibus* 3^{tiis} *et* 4^{tis} *inflexis ; femora antica subtus bituberculata ; tibiæ anticæ imbarbatæ ; tibiæ posticæ callo tomentoso apicali destitutæ.* *Long.*, 9 *mm.*

This species bears such a close resemblance to the common and well-known one, *H. dentipes*, that I shall very briefly describe it, chiefly dwelling upon those points in which it differs from that species.

The colour is somewhat of a blue-black, while *H. dentipes* has a brown tinge; the fly is also rather larger than that species, and the eyes of the male are rather nearer together, being sub-contiguous. The thorax is more distinctly striped. The abdomen, when viewed horizontally from behind, is entirely of a glistening white colour, but shows a few dark tessellations when looked at from above or in front. There is a longitudinal dorsal stripe, which is narrow and quite straight, and not interrupted or dilated in the middle or at the edges of the segments, as is usually the case with the stripe in *H. dentipes.* The legs are long, the hind femora reaching to the end of the abdomen. The fore femora have one rather short, stout, but sharp pointed tubercle or tooth beneath their anterior extremities towards the outer side, and a blunt tubercle placed a little further back on the inner side of it. In *H. dentipes*, though the species is called unidentate, there are really two teeth lying close together and parallel with each other. The fore tibiæ are thicker and less indentated than those in *H. dentipes*, and destitute of the little tuft of hair on their ends, which are so characteristic of that species. The middle femora have a much smaller and thinner tuft of hairs at their bases on the under and anterior surfaces than those which are found in *H. dentipes.* The middle tibiæ are armed much in the same way as I have described those of *H. dentipes* to be in my list. The hind tibiæ have no tubercle or callosity at their inner extremity, and also differ from those of *H. dentipes* by having a group of strong bristles in the middle of their anterior or under surfaces.

The wings are brown or nigrescent at their bases, and along their front halves; the third and fourth longitudinal veins are rather more convergent than in *H. dentipes*, the fourth especially being more bent. The external transverse veins are rather more oblique and sinuous than those of *H. dentipes* usually are. The calyptra have the scales rather larger than those in *H. dentipes*, the under one projecting further beyond the upper one; they are also surrounded by a darker yellow rim The *Halteres* have light stalks and brown heads. The female is unknown to me.

I found two males of this fly at Douglas, I. M., in June, 1885, in a plantation at the back of the Castle Mona Hotel, along with numerous specimens of *H. dentipes.*

H. IMPEXA, Loew.*

I found a single male of this pretty species at Windermere in June, 1884, and have met with it since near Bradford; I have also received specimens from other parts of England, and at the beginning of August, 1886, captured several of both sexes near Ulverston, Lancashire.

It is a well-marked species, about 6 mm. in length, of a shining black colour, with the thorax unstriped, but the abdomen with grey reflexions and a narrow dorsal stripe. The eyes are bare, and contiguous in the male, the third and fourth longitudinal veins of the wings are straight and nearly parallel. There is a peculiar grey patch of very minute microscopic hairs running across the wing just in front of the external transverse vein, and extending to the posterior border, this is absent in the female. Another characteristic feature in this species, is the presence in the male of a group of strong blunt black spines on the under surfaces, of the middle femora, near their bases.

The females are rather smaller than the males, but like them shining black.

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* Beschreibungen Europ. Dipt., iii, Band, Halle, 1873.

HOMALOMYIA, Bouché.

H. FUSCULA, Fall.

This species is undoubtedly synonymous with Meigen's *H. floricola.* Fallén's description of the male of *H. fuscula* agrees with Meigen's description of the same sex of *H. floricola*, but not with Meigen's account of *H. fuscula.* The latter author seems to have applied Fallén's name to an entirely different species, for he says in his description of *H. fuscula* that the abdomen of the male is short, whereas it ought to be oblong (länglich), as he correctly states it to be in his description of *H. floricola.* He also says that it shews brown reflexions, which are not present in the latter species. Lastly he states that in the female of *H. fuscula* (that of *H. floricola* was unknown to him) there is a wide frontal stripe, whereas it is a characteristic feature of this species that the space between the eyes in the female is unusually narrow ; not much more than double the width of that in the male.

Fallén's name being the oldest must supersede that given by Meigen, and the synonymy of the species will therefore stand thus—

H. FUSCULA, Fall. et Zett.
floricola, Meig. et Schiner.
cilicrura, Rond.

H. SPISSATA, Meade.

My friend Mr. Verrall has pointed out to me that this species was described by Loew under the name of *H. coracina*,* before the part of my annotated list appeared, in which I recorded it as a new species, I therefore hasten to make the correction.

The name of *spissata* must therefore sink into a synonym, thus—

H. CORACINA, Lw.
spissata, Mde.

H. ROSERII, Rond.

Mr. Verrall has recorded the capture of this pretty little species in England,† and kindly gave me two specimens. The male has the thorax of a shining metallic brownish-black colour, with white sides and shoulders. The scutellum is brown with a reddish margin. The abdomen is of a clear transparent whitish yellow colour at the base, and black at the apex. The legs, with the exception of the tarsi, are bright yellow.

H. TRIANGULIFERA, Rond.

On carefully examining the small specimens of *Homalomyia*, which I had placed together under the name of *H. serena*, I found that they consisted of two distinct species, nearly allied, but presenting several decided points of difference. One of these I now propose to place under Rondani's name of *triangulifera*, as his description agrees with it more closely than that of any other species that I can find, with the exception perhaps of *H. lugubrina*, of Zetterstedt ; and also because the name is very appropriate ; one of the most distinguishing characters being the presence of three very well defined triangular spots on the dorsum of the abdomen.

The male is of a shining black colour on the thorax, the shoulders and sides being marked with white; the eyes are sub-contiguous; the abdomen is of a glaucous-white colour, with black triangular marks. The middle femora are armed beneath with long and strong spines, which are grouped together, somewhat into the form of a tuft, towards the centre. The middle tibiæ are ciliated along the whole length of their under surfaces with stiff hairs, which gradually increase in length towards the extremity. The hind tibiæ have only a few irregular bristles on their outer sides, and no long hairs on their outer ones. The wings are fuscous. The female is like the male in colour, the thorax being black, and strongly marked on the sides with white; the abdomen is brown, shining, and immaculate. The length is about 3½ mm.

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* Berliner Ent. Zeit., xviii, 47.

† List of a hundred new British species of *Diptera*, Ent. Mo. Mag., vol. xxii.

This species is not uncommon. It is rather larger than *H. serena*, has a more glaucous abdomen, with more distinct triangular marks; it is of a blacker colour, the legs being quite black; the middle legs are more strongly armed with spines and hairs; the transverse veins of the wings are rather farther apart, and the axillary vein is longer and more curved, curling round the extremity of the anal vein.

H. NIGRISQUAMA, *sp. n.*

Mas, thorace ex toto nigro-nitido; abdomine cinereo micante, linea dorsali nigra, fasciisque transversis nigrescentibus obscuris; oculis nudis maximis, contiguis; alis brevibus fuscis; calyptris atris; halteribus flavescentibus; pedibus simplicibus nigris. *Long.*, 4 *mm.*

Head rather wider than the thorax, the sides being entirely covered by the eyes, which are large, bare, and contiguous.

Thorax shining black, without any signs of white on the shoulders or sides.

Abdomen rather wide, conical and flattened, without projecting anal appendages; it shows grey and black reflections, when viewed from behind, and has a longitudinal black dorsal line, which is interrupted at the sutures, but not dilated into definite triangular spots, as in many species in this genus; when viewed in certain lights, however, brown or black ill-defined patches shew themselves across the middle of the segments.

Wings short and sub-nigrescent.

Calyptra have the scales of moderate and unequal sizes, and of a brownish-black colour.

Halteres bright yellow.

Legs quite black, and simple, showing no special armament or structure, with the exception of there being two little tufts of short bristles which project one on each side from the under surface of the ends of the middle femora.

I have only seen two examples of this well-marked little species; one was captured on July 7th, 1882, near Bicester Oxon, and the other at Conishead Priory, near Ulverston, on August 2nd, 1886. I do not know the female.

(*To be continued*).

DESCRIPTION OF A NEW SPECIES OF *ELACHISTA* ALLIED TO *RHYNCHOSPORELLA*, STN.

BY H. T. STAINTON, F.R.S.

Elachista scirpi, n. sp. Exp. al., ♂, 4½ lin.; ♀, 5—6 lin.

Head and face grey or whitish (not so white as in *rhynchosporella*).

Anterior-wings white, much suffused with grey, especially below the costa and towards the inner margin; these grey markings have, however, no definite outline (therein differing from *rhynchosporella*), but have a powdery appearance; a blotch of this character lies on the inner margin near the base, and another on the middle of the inner margin; above this latter is a short black dash in the fold; beyond the black dash the powdery scales form an obscure angulated fascia (very different from the more definite mark in *rhynchosporella*, which may be compared to a prostrate V), beyond this are more powdery scales towards the costa, and others along the hind margin; cilia pale grey, intersected by a dark grey line, in, or before, which at the apex is a minute black dot (more perceptible than any thing analogous which we find in *rhynchosporella*).

In *rhynchosporella*, the costa to beyond the middle is more decidedly and broadly dark than in *scirpi*; yet there is no denying the fact, that though the insects *look* different, it is by no means easy to define them by sharp characters.

This insect was first sent to me by Mr. Barrett in 1875, he having met with it in a salt-marsh near Pembroke, where he collected it again more freely in 1876; it seemed to frequent there a short species of rush. Mr. W. H. B. Fletcher has now bred it freely from larvæ collected in the leaves of *Scirpus maritimus* near Worthing, and by the help of his bred specimens, I have been able to sketch out the characters above given, Mr. Fletcher having also kindly given me his ideas as to the points of distinction between the two species.

Mountsfield, Lewisham, S.E.:
March 14*th*, 1887.

On the life-history of Elachista scirpi.—While staying in the New Forest in June, 1883, the Rev. C. D. Digby told me that in the previous summer he took in the Yarmouth Marshes specimens of an *Elachista*, which he thought might be of an undescribed species. Accordingly, about the middle of the month, we went together to the Isle of Wight. In the evening we found the insect flying in swarms at intervals between 5.30 and dusk. So abundant was it, that although towards the end of the flight I only boxed good specimens, I set one hundred, all males, the next morning before breakfast. In April, 1884, I searched among the herbage for the larvæ. At the south end of the Marsh there was growing on a little mud bank, so that one could place the leaves between one's eyes and the sun, what I then took for a fine-leaved grass, but now believe to have been *Juncus Gerardi*. In some of these leaves were small *Elachista* larvæ, from which resulted a few *E. cygnipennella*, and a dwarfed male of *E. scirpi*. Neither Mr. Digby nor I was able to make much more of this clue until May, 1886, when, while collecting larvæ of *Bactra* in a ditch near Worthing, I found some *Elachista* larvæ in the leaves of *Scirpus maritimus*, which proved to be those of our old Yarmouth friend. The mines are short and broad, and usually placed in the upper half of the leaves. The larva bores upwards or downwards, depositing its "frass" in long dark masses in the middle of the mine, and at the end of it opposite to that at which it feeds. The empty part of the mine is pale greenish-white, and very conspicuous.

The following description of the larva was taken on May 25th:—Length, ⅜-in.; tapering posteriorly; head pale yellow, dark brown about the mouth; body pale greenish-yellow, with indistinct dorsal line; there is a row of indentations on each side of the latter; the lateral skin-fold marked out by larger indentations above and below; segmental divisions distinct. The larvæ pupate on silken pads, which are often spun on the midrib of a leaf of the food-plant. The moths began to emerge in captivity on June 15th. The species is obtainable over a long period, for I see that I took three moths on June 10th, several larvæ and two moths on June 16th, and larvæ, pupæ, and moths on July 3rd. I failed to find any larvæ in 1886 in leaves of *Juncus Gerardi*, but feel sure that in this neighbourhood also they feed in this plant, as the moths were abundant among it at some distance from any *Scirpus*.—W. H. B. Fletcher, Fairlawn House, Worthing: *March 7th*, 1887.

Ephestia Kühniella, Z., in England.—Seven years ago the late Professor Zeller sent me specimens of an *Ephestia* which he had just described (Stett. Ent. Zeit., 1879, pp. 466—471) under the name of *Kühniella*, he having received larvæ in 1877 from Dr. Kühn, of Halle, who had found them in a mill there, in which much American wheat was ground. On the wheaten flour the larvæ fed, and, according to the miller, they were particular in their tastes, and would not eat the *rye*-meal.

With the moths Professor Zeller sent living larvæ, explaining that I should have no difficulty in breeding as many of the moths as I pleased. Following his directions, I placed the larvæ in close-fitting boxes, in which I had put some soft paper, some bran, and plenty of wheaten flour. The larvæ burrowed among the bran and flour, eating the latter, and forming loose passages of web until full fed, when they spun up among the paper, and the moths emerged in July. They appeared quite contented, and duly laid plenty of eggs, from which a second brood appeared in (I think) October or November. From the eggs of these the next brood appeared in the following summer, the only attention paid them in all this time being the occasional addition of a little flour. When, in the autumn, the offspring of this third brood went on contentedly feeding up in the same boxes, I felt I had carried the experiment far enough. I had satisfied myself that if introduced the species would flourish, increase and multiply, and it seemed possible that if moths or larvæ were to escape, I might be the unwilling means of introducing a mischievous pest. I therefore destroyed all the larvæ I had. I find now that (as indeed might be expected) this species, which had reached Germany ten years ago, has probably been established in this country for at least half that period. It has spread widely on the continent, and a very exhaustive account, with a beautiful plate, is given by Snellen in Tijdschr. Ent., 1885, p. 237, pl. viii. Mr. William Thompson, of Stoney Stratford, sent me a few days ago, under the name of *ceratoniæ*, specimens which undoubtedly belong to *Kühniella*. He tells me that he reared them from larvæ found in abundance among rice cones (which appear to be a mixture of ground rice and wheat meal), on the premises of a baker in his own neighbourhood. The material was brought from a warehouse in a neighbouring town, but whence previously obtained could not be traced. The moths, had however, been noticed sitting on the meal-room walls from time to time for three or four years. Having, therefore, made good its footing with us, there is little prospect that the species will die out, but from its highly domestic habits, and the universal necessity for its pabulum, it is more likely that it may in time become, like *Pyralis farinalis*, a common domestic pest.

Ephestia Kühniella is the size of *ficella*, pale grey, much dusted with dark slate-grey. The first line blackish, indented, and, above the dorsal margin, deeply angulated, as in *Myelois ceratoniæ*. Second line deeply angulated near the costa, and indented below. Between these two lines is a black curved streak along the apex of the discoidal cell, but, in many specimens, this is very indistinct. In well-marked specimens there is a black line from the costa, just beyond the second line, and parallel with it for a short distance. This, which is very oblique, points towards the discal streak, and beyond it to a dark cloud on the dorsal margin near the middle, and gives the appearance of a central shade or cloudy fascia from the costa, near the apex, to the dorsal margin near the middle. The hind margin is dotted with black, the cilia are grey. Hind-wings, glossy white with brown veins and hind margin.

This species may readily be separated from our other species of *Ephestia* by its deeply indented first line, even when the oblique shade is not conspicuous, from *Myelois ceratoniæ* by its narrower fore-wings and far more slender thorax and abdomen.—CHAS. G. BARRETT, King's Lynn, Norfolk: *March* 14*th*, 1887.

Aporia cratægi in Devonshire.—I believe there are only two records of *A. cratægi* from the county of Devon, of which one rests on a dealer's statement. My friend, Dr. Jordan, once saw in a dealer's collection at Exeter specimens of this insect, and asking where they were taken, was told that they came from Moreton Hampstead. The other record comes from Canon Tristram. Knowing that he had taken *cratægi* at Torquay, I wrote, asking him for details. This reply is so interesting and important that, with his permission, I here give it verbatim.

"I was at Torquay in ill health in the spring and summer of 1854. In the late spring or early summer I came across numbers of this butterfly in one field, a grassy slope, with steepish banks adjoining a wood. I think it was what they called the Castle Hill, but I have never been there since, and my memory is not clear as to this. I never saw the insect except there, I did not come across it anywhere else. It is the only time or place I have ever seen it in England. I do not think it lasted many days, and I should say all I captured were in the same field. I filled a store box I know, and for some years supplied my friends from it. I have still a nice row of them, but I have long ceased to add to my collection, and was quite unaware till I received your letter that there was any special interest attaching to *A. cratægi*. Can it have been a sudden outburst not usual at that place, like my getting eleven *Vanessa Antiopa* on one geranium bed in a friend's garden in Norfolk before breakfast one morning? I had no entomological acquaintances at Torquay, so I assumed this to be a normal occurrence. I may add I took on the shore there a fine specimen of *D. pulchella* about the same time, and succeeded in hatching and rearing the eggs on Marvel of Peru."

In Loudon's Magazine of Natural History, vol. iii, p. 247, I find the following notice of this butterfly:—

"1826—*Papilio cratægata*, black ribbed butterfly, is rather a local insect. In the previous summer I met a scientific tourist from Suffolk, who informed me that he had visited Hants to procure this insect, which he understood was here plentiful; we searched for it several days to no purpose, but this year they were more numerous than even the common Cabbage White, abounding in every field; since then very scarce."

These cases point very strongly to migration as the cause of the abundance of this species; its occurrence at Torquay being an almost isolated instance of its appearance in Devon. The only inference that can be drawn from these facts, and those already brought before us, is that, after trying to establish itself in this country, it succeeded in holding its own for a few years, but, eventually, found the climate unsuitable, possibly too humid, and, therefore, gradually succumbed.—G. T. BAKER, 16, Clarendon Road, Edgbaston: *March 16th*, 1887.

Is Aporia cratægi extinct in England?—Mr. Tutt, in his notes on this subject (*ante*, pp. 220, 221), suggests "that migration lies at the bottom of the probable cause of the great falling off observed in the number of this species." By this, I understand Mr. Tutt to mean that the same conditions of the climate of this country, which have been unfavourable to the development and increase of indigenous specimens of this species, and have tended towards its rarity or extinction, have also prevented its recruiting its numbers by migration, or rather immigration, from the Continent. The absence or existence of climatic conditions favourable to immigration, is, no doubt, the cause of the rarity or abundance, in any year or succession of years, of *Colias Edusa*, *Colias Hyale*, *Vanessa cardui*, *Sphinx convolvuli*, and other migratory and cosmopolitan species, but *Aporia cratægi* cannot, I think, be placed in the same category as these, and before we can entertain the hope that it "will become common again" when "we get a fresh stock from the Continent," it is necessary that some evidence should be forthcoming that it is migratory in its habits. According to my experience, *Aporia cratægi*, although a powerful flyer, and capable of soaring to a great height when pursued or alarmed, is usually a gregarious and sluggish insect, occurring chiefly in colonies, in the immediate neighbourhood of the trees or shrubs on which it fed in its larval stage, and in this respect resembling species of the genus *Melitæa*. If *A. cratægi* is migratory in its habits, why do we not occasionally hear of its capture in Kent, and other parts of the South East of England, in those seasons when a larger number than usual of such species as *Pieris Daplidice*, *Argynnis Lathonia*, and other immigrants from the Continent occur? As it is an abundant species in many parts of the Continent of Europe there ought not to be any difficulty in ascertaining from Continental Lepidopterists whether or not it is migratory in its habits.

With reference to the concluding remarks of Mr. Tutt, I fail to see how the prejudice to Continental types of British species, which may possibly still be entertained by *some* collectors of British *Lepidoptera*, can affect the consideration of questions concerning the geographical distribution or migration of species.—H. GOSS, Surbiton Hill: *March*, 1887.

[We shall be glad of precise information on the point raised by Mr. Goss. At present we are disposed to agree with him to the effect that *A. cratægi* is *not* a migratory species, and think that any hope of resuscitating it in this country must rest on artificial introduction and perfect abstention from "collecting" for a long time. Not believing, *as a rule*, in extermination by collectors, we are, nevertheless, disposed to think that "over-collecting" may have played a prominent part in the disappearance of this butterfly, viewed in connection with its gregarious habits in its earlier stages (which rendered it an easy prey to wholesale collectors) and its "localization" here. But we are compelled to adopt the idea that the decadence of many of our butterflies is mainly due to undefined natural causes. Stephens, in his "Illustrations" *(Haust.*, i, p. 27, 1827) says, that in June, 1810, he saw *A. cratægi* in plenty in Coombe Wood, and that on the following year he captured several at Muswell Hill, but had since never seen it at large, and he adds that Mr. Haworth used to constantly take it at Chelsea. The "Cabbage Whites" are notoriously migratory, and immigration no doubt frequently recruits our already too-abundant supply.—Eds.]

On the life-history of Depressaria ciniflonella, Z.—In March, 1885, I received from Mr. Salvage, then collecting at Rannoch, some living females of this species, with the information confirming a previously formed guess of my own, that the larvæ would be likely to eat birch leaves. One of these moths laid about a dozen eggs, the greater part of them in a row along the crevice between a birch bud and the twig on which it grew, fastening them to the scales of the bud. When I first saw these eggs they were very bright red, and became, a few days before hatching, dark smoky-purple in colour. The young larvæ appeared during the last half of April, and took readily to birch, *Betula alba*. The following description was taken on May 12th :—

Length, about $\frac{1}{3}$-in., tapering towards both ends ; head dark brown ; corselet almost black, bisected by thin median line ; anal segment with black plate, and large black spots on anal claspers ; body, dull sage-green, the spots large with black bristles.

On May 25th, being about full-grown, they were again described, thus :—

Length, about $\frac{3}{5}$-in. ; head pale reddish, marked with dark brown about the mouth ; corselet and anal plate blackish ; body purple-brown, rather lighter anteriorly ; spots, large and black. By June 8th the larvæ had pupated. The pupa is about $\frac{5}{16}$-in. long ; the colour of the body red, that of the wing-cases olive-brown, with a greenish tinge.

The larvæ live in a tube open at both ends, formed by turning down a piece at the edge of a birch leaf, or by folding one down the middle. The moths emerged towards the end of June, and were, on the average, larger than wild specimens from the same locality, from which I conclude that birch is almost certainly the natural food-plant of the larvæ.—W. H. B. Fletcher, Fairlawn House, Worthing: *March 7th*, 1887.

Remarkable variety of Eudorea pyralella.—In the end of June, 1886, when collecting on our Isle of Purbeck coast, I was fortunate enough to meet with four examples of a most beautiful and striking variety of *Eudorea pyralella*. The fore-wings are pure white, and, with the exception of a few coloured scales at the base, and a small wedge-shaped blotch and dotted line at the extreme hind margin, the only markings are contained between the first and second lines, and are of the usual type and colour: the space enclosed by these lines shows out against the clear white ground colour as a well-defined and conspicuous central fascia. There is not the faintest trace of any subterminal band.

Between the typical *E. pyralella* and this extreme form, which exactly corresponds to, but is even whiter than, the very whitest examples of *E. frequentella*, var. *portlandica*, the local coast variety *ingratella* is an intermediate link.

These four specimens of this pale variety were all I could meet with out of numbers of the usual type.—Eustace R. Bankes, The Rectory, Corfe Castle: *February 24th*, 1887.

Notes on Sesia philanthiformis in West Cornwall.—During my short stay at Penzance last summer, I had more than one opportunity of observing the habits of this interesting lepidopteron. My first acquaintance with it was made on the 7th of July, when I visited the Logan Rocks which are situated on the coast and not many miles distant from the Land's End. The weather, on this occasion, was marked by continuous sunshine, combined with a higher temperature than I believe is usually registered in this part of the country, but, happily, the otherwise oppressive heat was, as is so frequently the case on the coast, considerably tempered by a freshening breeze. I had not arrived at the "Rocks" long, before I became aware of the presence of several insects flitting about the herbage. These, I at first thought were small wasps or other *Hymenoptera*, but subsequently noticing that the ground was thickly covered in places with common thrift *(Armeria vulgaris)*, I began to suspect that they might, on further examination, prove to be *Sesia philanthiformis*. Some time was spent, as may be readily imagined, before a specimen could be marked down, for in such a wind they seemed as it were to disappear almost magically. However, after repeated failures, I at last succeeded in tracing one of them until it settled on some short grass, and a brief glance at the individual sufficed to convince me that it was *S. philanthiformis*.

Possessing only a "type" of this species in my collection, I naturally became anxious to secure specimens, but not having a net with me, I found this a difficult matter. Therefore, at the risk of rendering the specimens worthless, I first tried to knock them down with the hat whilst they were at rest. This procedure resulted in a miserable failure, for if I knocked *one* down, which is questionable, I certainly could never find it. After several abortive trials of this rough method, I contrived (not without many ineffectual attempts) to invert the hat over a specimen, but only again to be foiled, for on slightly elevating the hat to box the coveted object, it once more exhibited its activity and darted off. Disappointed in every way, I soon gave up all hopes of obtaining specimens, much as I wanted them. However, about 1 p.m., whilst on my way back by the fields to the village, for the purpose of driving to the Land's End, I again came across the species. This time fortune favoured me, for it was flying about in numbers on the lee-side of one of the quaint stone walls, which are so strikingly characteristic of this part of the country, serving as they do for fences. After watching the insect for a short time, I observed that although its food-plant, the common thrift, grew in plenty on the wall, it invariably settled on the flowers or foliage (principally the latter) of wild thyme. Once settled on this plant, a specimen would allow itself to be approached and looked at. It was now that I found my glass-bottomed boxes useful, and, in a very short time, I had the satisfaction of securing nine specimens. An examination of the thrift on the wall shewed evident traces of its having been tenanted by larvæ, doubtless of the same species. Upon arrival at the Land's End, *S. philanthiformis* again came under my notice, but it did not appear to be so plentiful there; perhaps it was too late in the day! A day or two afterwards I observed a few more on walls, not far from Porthcurno, and two or three were netted. But I shall ever regret that I had not the net with me on the 7th July, for by means of it, and a good supply of boxes, I am confident that I could have obtained many scores of good specimens.

From my short experience of this species, I should not be surprised if it were found to exist in all those situations on the coast of West Cornwall in which its food-plant grows in any appreciable quantity.—Edward A. Atmore, King's Lynn, Norfolk: *February 17th*, 1887.

Notes on Ephippiphora tetragonana.—My first acquaintance with this species was made on the 9th August, 1885, when I casually met with two specimens—not in the best condition—in a wood near this town. Owing to the lateness of the season, I only obtained three or four more that year, but determined to look out for it earlier in future, and I am pleased to say that my efforts last year were rewarded with a good series. The earliest captures were made on the 18th July, when the insect was in fine condition; and I continued to meet with it till the middle of August, the condition being generally good up to the first week in that month. From observation, I should say that the best time of the day for it is from 6 p.m. to 7 p.m., when it flies rather *briskly* about two or three feet above the ground amongst the wild rose bushes, which are scattered over a considerable portion of the wood. Its flight is rather similar to that of its congeners, *E. cirsiana* and *E. bimaculana*, but still more closely, I think, resembles that of *Orthotænia striana*. Not unfrequently I watched it till it settled on a rose, or bramble leaf, but it never rested long. In the bright sunshine it flies more rapidly, and is then, from its colour, somewhat difficult to follow with the eye. Its food-plant here is, to my mind, *undoubtedly rose*, and I searched hard for the larvæ last May, though without success. This year, however, I have good hopes of being more fortunate in this respect, and, if so, shall be glad to communicate the result.—W. A. Atmore, 11, Albion Place, Grantham: *February 22nd*, 1887.

Homalota cavifrons, Sharp.—Homalota cavifrons occurs not uncommonly in the Pentlands in spring and autumn, and also in the Queen's Park, Edinburgh, on the under-sides of stones lying on the turf, and in moss. The males, which are easily distinguished by the wide frontal depression and the black bristles at the extremity of the abdomen, vary a good deal in colour, some specimens being much paler and more rufous than others, without, apparently, being immature. The females, which are much more like *analis*, but smaller, and with shorter elytra, are generally uniformly dark in colour. They are very active, and when two or three are on the under-surface of a stone, it is no easy matter to secure them, especially if a high wind is blowing.—R. F. Logan, Colinton, Midlothian: *March 11th*, 1887.

Hydnobius punctatissimus, Steph., &c., near Margate.—Upon the 8th of November last, while casually strolling along the shore, I found a few specimens of this beetle crawling upon the cliffs, and a brief search brought me to its head-quarters. Here it was in the utmost profusion, both ascending the cliff and crawling upon the sand below; so much so, in fact, that before I came away I secured nearly 500 specimens. For more than a week it continued in the utmost profusion, aud even so late as the 3rd of December a specimen settled upon my hand as I was walking along.

This beetle appears to be longer than most in attaining its mature colouring. Nearly one-third of the specimens that I took were yellow or very pale brown, and some that I kept alive and exposed to the light for five days had altered little at the end of that time. At first I thought that these pale individuals might possibly belong to another species, but I can detect no structural difference, and therefore conclude that they are merely immature *H. punctatissimus.*

At the same time I also took eight examples of the pretty little *Ceuthorrhynchideus frontalis*, Bris., which is rather hard to see as it sits motionless upon the cliff.

Diglossa mersa was extremely plentiful one morning—far above high-water mark—in company with *Phytosus spinifer*, but subsequently I found only two or three specimens.—Theodore Wood, St. Peter's, Kent: *February 6th*, 1887.

Wireworms in winter.—It seems to be generally supposed that wireworms descend deeply into the soil during the winter months. During the last six weeks, and even immediately after tolerably severe weather and prolonged frost, I, however, have found them feeding upon Jerusalem artichokes within an inch or two of the surface. I imagine that when food is abundant they do not trouble to descend at all, and only hibernate, strictly speaking, when it is not to be procured. Many larvæ, we know, may be frozen without injury to themselves, and wireworms are perhaps as robust as any. It is therefore scarcely likely that any but a severe frost should drive them so far below the surface when food in plenty is to be obtained; and certainly it has no such effect in the garden here.—Id.

Aphodius consputus, Cr., near Margate.—Early in last November I had the good fortune to capture fifteen specimens of this rarity, as they were crawling up the cliffs in company with a host of other insects. Not recognising them at the time, I imagined them to be a varying form of *A. prodromus*. Upon examining them at home, however, I was at once struck by the conspicuous yellow blotch upon either side of the head, and by the yellowish centre to the metasternum; and then their true character, of course, was evident enough. In company with them I also took *A. porcus* and *A. tessulatus* in some numbers. I fancy that many of the rarer *Aphodii* appear later in the year than is generally imagined, and so escape the notice of collectors. As far as my own experience goes, shore and cliff collecting, to which I am indebted for many of my best captures, is remunerative at least until the end of November.—Id.

Obituary.

John Sang.—We regret to announce the sudden death of Mr. Sang, who was found dead in his bed on the morning of Sunday, March 20th. The cause of death was valvular disease of the heart. A detailed notice will appear in our next No.

The South London Entomological and Natural History Society: *February 24th*, 1887: R. Adkin, Esq., F.E.S., President, in the Chair.

Messrs. J. E. Kelsall, J. Lea, and E. B. Nevinson, were elected Members.

Mr. Tutt exhibited *Tephrosia crepuscularia*, Hb., from Hungary, and remarked that he was unable to obtain any forms of *T. biundularia* from there although he had received it from Germany; he further showed continental forms of *Agrotidæ* and specimens of *Acidalia perochraria*, Fisch., and contributed notes. Mr. R. South, *Lobophora polycommata*, Hb. (bred). Dr. Rendall, *Calocampa solidaginis*, Hb., from Cannock Chase. Mr. Tugwell, English and Scotch forms of *Lycæna bellargus*, Rott. Mr. R. Adkin, *Notodonta ziczac*, L., *Dianthœcia capsophila*, Dup., *Aplecta prasina*, Fb., and *Eupithecia pumilata*, Hb., from County Cork, with specimens from various English localities for comparison. Mr. J. J. Weir read a paper on "Melanism." Mr. George Smith gave an exhibition of photo-micrographic slides.

10*th March*, 1887.—The President in the Chair.

Messrs. D. J. Rice and H. H. Druce were elected Members.

Mr. Goldthwaite exhibited *Nyssia hispidaria*, Fb. (bred). Mr. J. W. Slater, a variety of *Arctia Caja*, L., having the red colour replaced by a yellowish or buff colour, and he stated that it had been bred by Mr. Mutch, of Hornsey, who had fed a number of larvæ on lime, and the remainder on the usual food-plants, with the result that all those fed on the lime were this yellow form, the others being normal. Mr. R. Adkin, *Zanclognatha tarsipennalis*, Tr., and remarked that nearly twelve months had elapsed between the escape of the larvæ from the eggs and the emergence of the imagines. Mr. Billups exhibited *Tapinoma melanocephalum*, For., taken in the Palm House, Kew Gardens, on *Horea Grisebachia*, from Tropical Australia, and he stated that this brought the number of Exotic ants found in Kew Gardens by Messrs. Smith, Saunders, and himself, up to seven species. Mr. E. Step contributed a paper on "Mosses."—H. W. Barker, *Hon. Sec.*

Entomological Society of London: *March 2nd*, 1887.—Dr. D. Sharp, F.Z.S., President, in the Chair.

The Rev. T. W. Daltry, M.A., F.L.S., of Madeley Vicarage, Staffordshire; Dr. Neville Manders, L.R.C.P., of the Army Medical Staff, Mooltan, India; Mr. Alfred Sich, of Chiswick; and Mr. J. T. McDougall, of Blackheath, were elected Fellows.

Mr. Slater exhibited, on behalf of Mr. Mutch, two specimens of *Arctia Caja*, one of which was bred from a larva fed on lime leaves, and the other from a larva fed on low plants, the ordinary pabulum of the species. The object of the exhibition was to show the effect of food in causing variation in *Lepidoptera.*

Capt. H. J. Elwes exhibited a large number of *Lepidoptera-Heterocera*, caught by him in the verandah of the Club at Darjeeling, in Sikkim, at an elevation of 7000 feet, on the night of the 4th of August, 1886, between 9 p.m. and 1 a.m. The specimens exhibited represented upwards of 120 species. He stated that Mr. A. R. Wallace's observations on the conditions most favourable for collecting moths in the tropics were fully confirmed by his own experience during four months' collecting in Sikkim and the Khasias. The conditions referred to by Mr. Wallace were a dark wet night in the rainy season; a situation commanding a large extent of virgin forest and uncultivated ground; and a whitewashed verandah, not too high, with powerful lamps in it. He said that on many nights during June and July he had taken from 60 to 80 species, and during his stay he had collected between 600 and 700 species. He also made some remarks on the Khasia Hills, the southern slopes of which he believed to be the true habitat of the greater part of those insects described many years ago by Prof. Westwood and others as coming from Sylhet, which was situated in a flat cultivated plain, under water during the rainy season, and not many miles distant from these hills. In consequence of the unhealthy and extremely hot and wet climate of these hills no Europeans had done much collecting there, but the specimens were chiefly caught by the natives and brought into the town of Sylhet for sale.

The Rev. W. W. Fowler exhibited a specimen of *Cathormiocerus socius*, taken a few years ago at Sandown, Isle of Wight. Mr. S. Stevens exhibited specimens of *Cathormiocerus maritimus* and *Platytarsus hirtus.* Mr. F. Grut said he was requested by Mons. Péringuey, of Cape Town, to announce that the latter was engaged on a monograph of *Hipporrhina*, and that he would be glad to receive specimens and other assistance from British Entomologists. Mr. Gervase F. Mathew communicated "Descriptions of new species of *Rhopalocera* from the Solomon Islands." Mr. George T. Baker communicated "Descriptions of a new species of the Lepidopterous genus *Carama*, together with a few notes on the genus;" and "Description of a new genus of *Rhopalocera* allied to *Thecla.*"—H. Goss, *Hon. Sec.*

LIST OF BRITISH *TIPULIDÆ*, &c. ("DADDY-LONGLEGS"), WITH NOTES.

BY G. H. VERRALL, F.E.S.

(*Continued from page* 209).

IDIOPTERA.

I am not sure that *I. fasciata*, L., is British, but think it most probable; Walker's description may apply to it, as he says nothing about the abbreviated wings of the female, but, on the other hand, he puts *I. pulchella*, Mg., as a synonym. *I. pulchella* I have taken at Lyndhurst and *I. trimaculata* at Aberdeen.

EPHELIA.

In this genus I know nothing of *E. decora*, Hal., given by Walker as a variety of *E. marmorata*, Mg., but Loew truly remarks that Haliday's description will not agree with any known *Ephelia*. Until very recently (1863) only one very variable *Ephelia* was recognised as European, but in that year Egger distinguished *E. miliaria*, and in 1871 Loew distinguished three more (one of which I think identical with *E. miliaria*).

Our British species, exclusive of *E. decora*, are not easy to tabulate, but the following table may assist in their determination:

1 (4) Wing veins entirely without small dots *on* them.
2 (3) The spots at the tip of the wing sharply separated; largish species... *miliaria*, Egg.
3 (2) The spots at the tip of the wing coalescing into a cloud, which occupies nearly all the tip of the wing; smallest species, and legs thinnest... *apicata*, Lw.
4 (1) Wing veins with some, or numerous, dark dots on them.
5 (6) Dots on the veins not numerous, hence considerable open clear spaces on the wings, supernumerary cross vein with its darkening spread both ways along the postical vein; smallish species............*submarmorata, n. sp.*
6 (5) Dots on the veins numerous, usually leaving scarcely any clear spaces on the wings, but the supernumerary cross vein does not extend its darkening along the postical vein; largest species .. ..*marmorata*, Mg.

The four species all differ in the vein which ends *in* the tip of the wing: in *E. miliaria* this is slightly clouded all along, except at the tip; in *E. apicata* it begins nearly clear, then runs through the large apical cloud, but finishes in a clear spot at its extreme tip; in *E. submarmorata* it varies a great deal, but is never like the preceding species, it usually has from four to six dark dots on it, and sometimes finishes in a dark dot; while in *E. marmorata* it is usually crowded with dots.

E. miliaria: not at all uncommon near the Shin in Sutherland last July, also at Inchnadamph.

E. apicata: one day, when at Inveran last July, I crossed to the Ross-shire side of the Oykel, and in a small valley this species abounded, while no other occurred; I believe it is a species very abundant when it occurs, but occurring in very restricted localities; I found it abundantly in a small locality near Bickleigh in Devonshire, in August, 1885, and to prove its wide distribution, I have a female caught in the Pistojese Apennines by the Rev. A. E. Eaton on August 5th, 1882. Loew described it from a wide area in Central Europe.

E. SUBMARMORATA, *n. sp.* (♂ ♀).—*Minor, inter* E. marmoratam *et* E. apicatam *sed ab hâc maculis in alarum apice sitis non confluentibus et venis longitudinalibus parce nigro-punctatis, et ab illâ magnitudine minore et alis clarioribus, distincta.*

A smallish species, resembling both *E. marmorata* and *E. apicata*; it is not quite so small as *E. apicata*, and the thorax is not so brightly striped; the wings are broader than in *E. apicata*, and have but few spots on the veins compared with *E. marmorata*; the spots near the apex, though not so black and sharply defined as in *E. miliaria*, still have not the least tendency to the characteristic cloud of *E. apicata*, and the presence of some dots on the veins distinguishes it from all except *E. marmorata*; from this its small size and the comparative scarcity of the dots on the veins at once separate it, while a peculiarity is noticeable at the lower end of the supernumerary vein, as the clouding of the vein spreads out both wings along the postical vein, giving the appearance of a ⊤ reversed; the scarcity of the dots about the veins leaves distinct the two (nearly) clear bands across the wings which are so noticeable in *E. apicata*. The genitalia are small and dark.

This species was abundant near Tunbridge Wells and Frant last June, and I met with it at Loch Maree in June, 1885.

E. marmorata is widely spread, but seldom abounds in one spot.

LIMNOPHILA.

1 (18) Subcostal vein ending almost with the cross vein connecting it with the radial.
2 (15) Præfurca never more than twice as long as the petiole of the first submarginal cell, often only about as long.
3 (14) Petiole of upper vein from discal cell at least half as long as the fork.
4 (5) Blackish-grey species ....*Meigenii*, Ver.
5 (4) Ochreous species.
6 (13) Thorax with a black central line, at least in front.
7 (10) Stigma distinct, though not conspicuous; species 20—30 mm. alar expanse.
8 (9) Wings somewhat pellucid, femora (when mature) blackish, leaving only the basal third luteous ....*dispar*, Mg.
9 (8) Wings distinctly yellowish; femora with only the tips dark... *lineola*, Mg.
10 (7) Stigma absent; species 16—20 mm. alar expanse.
11 (12) Discal cell closed ....*lineolella*, *n. sp.*
12 (11) Discal cell open ....*aperta*, *n. sp.*
13 (6) Thorax entirely ochreous, with no trace of a central black line... *ferruginea*, Mg.

14 (3) Petiole of upper vein from discal cell not a quarter the length of the fork (radial vein strongly arched after the præfurca) .... *ochracea*, Mg.

15 (2) Præfurca three or four times as long as the petiole of the first sub-marginal cell (base of præfurca clouded).

16 (17) Blackish-grey species ....*bicolor*, Mg.

17 (16) Ochreous species ....*punctum*, Mg.

18 (1) Subcostal vein continued a considerable distance after the cross vein connecting it with the radial (præfurca always long). Petiole of upper vein from discal cell (normally) from two to ten times as long as the fork (fork sometimes absent).

19 (26) Petiole of upper vein from discal cell scarcely longer than the fork, often shorter; marginal cross vein exceedingly near base of radial fork (except in *L. sepium*), base of the discal cell not in a line with the base of the two cells above, (*conf. L. nemoralis, var.*).

20 (23) Great cross vein after middle of discal cell, antennæ bearing bristly hairs three or four times as long as each joint.

21 (22) Entirely ochreous, veins at end of wing approximating.. *fuscipennis*, Mg.

22 (21) Disc of thorax shining dark brown ....*discicollis*, Mg.

23 (20) Great cross vein before middle of discal cell, antennæ bearing bristly hairs about twice as long as each joint.

24 (25) Pleuræ grey .... *lucorum*, Mg.

25 (24) Pleuræ yellowish ....*sepium*, Ver.

26 (19) Petiole of upper vein from discal cell (normally) from two to ten times as long as the fork (fork sometimes absent).

27 (28) Light grey species, usually with stripes on thorax, medium sized .. *nemoralis*, Mg.

28 (27) Thorax blackish, or brownish unstriped, small species.

29 (30) Blackish, wings narrow, almost bare .... *filata*, Wlk.

30 (29) Brown, wings broad and pilose, even on the disc near the tip... *senilis*, Hal.

The above sixteen species form a very natural group, with the possible exception of *L. senilis*, which, however, has all the essential characters of the genus. Two or three more species may be expected to occur in Britain, and a good deal remains to be done in synonymy, as I certainly do not agree with the continental writers in all cases; I think, however, I have completely cleared up all the British synonyms, many of which had previously been of considerable trouble to students.

L. Meigenii: the *Limnobia nigrina* of Meig., Sys. Bes., vi, 277 (1830) cannot retain its name against *Limn. nigrina*, Wied., Auss. Zw. Ins., i, 37 (1828), even though they may some day be proved to belong to very different genera (Osten-Sacken suspects Wiedemann's species to be a *Gnophomyia*, a genus near *Trimicra*), so I have called the European species *L. Meigenii*. It is a well-marked species, not at all uncommon in Britain, though it seems to have been very much overlooked on the continent. I have taken it at Lyndhurst, and in several localities in North Scotland, and at Inchnadamph it occurred very abundantly on a large flat moor.

L. dispar, Mg.: a very common species in many localities in Sussex, Kent, Hants, and Herts. I have seen Walker's original types of *L. dispar* and *punctum*, which are undoubtedly the same species. Immature examples of this species sometimes have the legs coloured almost as in *L. lineola*, but the more pellucid tint of the wings at once identifies them.

L. lineola, Mg.: this is slightly the largest British species of the genus, and may be known at once by its yellowish-tinged wings with a faint but quite distinct stigma. I have taken it in Sussex, Hampshire, and Cambridge.

L. LINEOLELLA, *n. sp.* (♂ ♀).—*Ferruginea, nitida; thoracis antice lineola dorsali nigro-brunnea; capite cano alis subflavido-hyalinis, stigmate vix ullo; pedibus flavis, femoribus apice obscuris. Long.* 9—10 *mm., alar. exp.* 19—21 *mm.*

♂. Back of head blackish, covered with whitish-grey tomentum, becoming somewhat silvery towards front, and also bearing yellowish-red hairs; the antennæ are shortish, reaching about halfway down the thorax when bent back, and have the basal joint blackish, the second roundish, blackish at base but dull ochreous at tip, succeeding joints oval, becoming elongate-oval, dull ochreous working up to darkish brown, bearing bristles about as long as each joint; palpi and rostrum brownish-black.

Thorax shining ochreous, with a black central line in front.

Abdomen well clothed with reddish-yellow hairs, usually with a dark line down the sides, and rather obscure above before the genitalia, but nothing at all like the blackish band in *L. ferruginea*, ♂; the genitalia the same colour as the abdomen, bearing yellow pubescence, the genital hooks not large and still the same colour, an internal piece is black, and there are no noticeable reddish-yellow bristles on the last segment of the belly as in *L. ferruginea*, ♂.

Legs ochreous, becoming indeterminately dark towards the end of the femora and onwards, the base of the tibiæ perhaps a little paler; even in pale specimens only obscure darkening and no determinate markings, while in dark specimens the darkening begins before the middle of the femora, but very indeterminately.

Wings pale yellowish-hyaline (*i. e.*, not as yellow as in *L. ferruginea* and *lineola*), with scarcely a vestige of a stigma; veins somewhat yellowish-brown, marginal cross vein about the middle of the upper branch of the radial fork, the basal portion of the radial (= the space between the end of the præfurca and the radial fork) about a third as long as the upper branch of the fork, the branches of the forked vein from the discal cell are almost the same length as their petiole, the last vein is very little undulating, very slightly incurved at its end. The base of the præfurca often has a trace of a recurrent vein, and the end of the mediastinal vein sometimes runs up so abruptly to the costa, that it seems as if a cross vein united it to the costa, while it gently curved on into the subcostal vein.

♀ very similar, but the ends of the femora are more determinately blackish. One specimen caught at Inveran on July 11th, 1886, has the disc of the thorax nearly all blackish, and is altogether a very dark specimen.

This is the commonest British species, and yet I think it is undescribed, unless it should prove to be the little known *L. fulvonervosa* of Schummel, but that (according to Schiner, as I do not possess Schummel's original description) has the femora in the female, which was the only sex he knew, not darkened at the tip ; besides I possess a single poor specimen which I think distinct from *L. lineolella*, and which may prove to be the true *L. fulvonervosa*.

The described European ochreous *Limnophilæ* are (1) *L. lineola*, Mg., Klass., i, 56 (1804), which I think is beyond doubt the largest yellow-winged species which I recognise, and which was badly described as *L. ferruginea* by Walker in I. B. D., iii, 286 : (2) *L. flavescens*, Mg., Klass., i, 56 (1804) ; not the *T. flavescens* of earlier writers, but the same as (3) *L. ferruginea*, Mg., Sys. Bes., i, 128 (1818) ; I have no doubt this is my *L. ferruginea*, because of the absence of any central dark line on the thorax, though it is somewhat remarkable that Meigen does not mention the dark fascia across the male abdomen just before the genitalia ; Schiner, however, mentions this, thus showing that he recognised the same species as I do : (4) *L. geniculata*, Mg., Sys. Bes., i, 124 (1818), an unrecognised species communicated to Meigen by Hoffmansegg, and possibly belonging here ; it is insufficiently described, but can hardly be any of my new species, as it has dark stripes on the thorax : (5) *L. fulvescens*, Mg., Sys. Bes., i, 127 (1818), another unrecognised species from Hoffmansegg, with apparently an unstriped thorax : (6) *L. punctum*, Mg., Sys. Bes., i, 128 (1818), in all probability the species I recognise as British, of which probably (7) *L. glabricula*, Mg., Sys. Bes., vi, 276 (1830), and (8) *L. longicornis*, Schum., Beitr. Ent., i, 166 (1829), and certainly (9) *L. binotata*, Zett., Ins. Lapp., 834 (1837), are synonyms : (10) *L. dispar*, Mg., Sys. Bes., i, 129 (1818), undoubtedly the common species I recognise, which is described twice over by Walker as *L. dispar* and *punctum* : (11) *L. præusta*, Schum., Beitr. Ent., i, 169 (1829), an undoubted synonym of *L. ferruginea*, Mg. : (12) *L. fulvonervosa*, Schum., Beitr. Ent., i, 164 (1829), which I have mentioned above : and lastly (13) *L. unicolor*, Wlk., I. B. D., iii, 289 (1856), which was *described* from a specimen of *L. ferruginea* which I have seen, but the *figure* on plate 27, fig. 2*e*, is from an *Amalopis*, probably *A. unicolor* of Schummel. There are, therefore, four well known and three doubtful species in Europe ; the four well known species and two or three others occur in Britain, the above described *L. lineolella* being very common ; it is described by Walker as *L. lineola*. I have met with it abundantly from the Channel to the North Sea (Lymington to Tongue).

(*To be continued.*)

NOTES ON *GALERUCINÆ*, AND DESCRIPTIONS OF TWO NEW SPECIES OF *HISPIDÆ*.

BY J. S. BALY, F.L.S.

Genus AULACOPHORA.

Aulacophora dilatata, Jacoby:—New genera and species of Phytophagous *Coleoptera* in the Genoa Civic Museum, 1886, p. 51.

This insect is a pale variety of *A. luteicornis*, Fabr.

Aulacophora semiopaca, Jacoby, *l. c.*, p. 51.

One of the numerous varieties of *A. bicolor*, Weber.

Since the publication of my paper on *Aulacophora* in the Linnean Proceedings, I have seen a series of this species, in which there is a distinct transverse depression below the basilar space; it is probably the most variable insect in the genus.

Genus MALAXIA.

Fairmaire, Ann. Soc. Ent. France, 5^{e} ser., viii, p. 139.

The above genus, formed by M. Fairmaire on a species from Central China, has since been re-characterized by Mr. Jacoby in Notes Leyd. Mus., vi, 1884, p. 62, under the name of *Glytolus*. M. Fairmaire, in his diagnosis, has given the claws as bifid, with the inner tooth short. Mr. Jacoby (more correctly) has described them as appendiculate.

1. *Malaxia flavovirens*, Fair., *l. c.*, p. 139, China. I possess several specimens of this species from various parts of China; in some the thorax and legs are stained to a greater or less extent with fuscous or black; one of these specimens M. Fairmaire has kindly compared with his type.
2. *Malaxia viridis*:=*Glytolus viridis*, Jacoby, *l. c.*, p. 62. Sumatra.

Genus SERMYLOIDES.

Jacoby, Notes Leyd. Mus., vi, 1884, p. 64,=*Præochralea*, Duvivier, Stett. Ent. Zeit., xlv, 1885, p. 245.

The present genus, as seen above, has been twice characterized, in the first place by Mr. Jacoby, secondly by M. Duvivier; both authors having taken the same insect for their type, there can, however, be no doubt but that this species had been previously described by Fabricius, under the name of *pallicornis*: the synonymy stands thus:—

Sermyloides pallicornis, Fabr., Sys. El., i, p. 483 *(Galeruca)*.

A. Elytris fulvis, margine exteriori apiceque nigris.

B. Elytris fasciâ latâ basali nigrâ, cæteris ut in A. *Sermyloides basalis*, Jac., *l. c.*, p. 65.

C. Elytris totis fulvis. *Præochralea antennalis*, Duv., *l. c.*, p. 245.

Hab. : A and B, Sumatra ; C, Philippine Islands.

Mr. Jacoby has described all the tibiæ as armed with a short spine ; M. Duvivier gives the anterior pair as unarmed. I have failed to discern any tooth on the anterior pair.

Genus NADRANA.

Dr. Chapuis has given an erroneous diagnosis of this genus ; he states that the anterior acetabula are open, the apices of the anterior tibiæ unarmed, and that the basal joint of the metatarsus is only equal in length to the following two united. In all my specimens, including the type, the anterior acetabula are entirely closed, the anterior tibiæ are armed with a distinct spine, and the basal joint of the metatarsus is longer than the following three united.

Beyond the shallow excavation on the disc of the thorax in *Nadrana*, which I look upon as a specific, not generic, character, and a slight difference in the relative lengths of the second and third joints of the antennæ, I do not see any reason for separating *Candezea* (Chap., Ann. Mus. Civ. Gen., xv, p. 24) from the present genus.

Genus OCHRALEA.

Dr. Chapuis, in the Genera des Coléoptères, gives the anterior acetabula in *Ochralea* as closed ; I have examined many specimens of *Ochralea flava* (Chapuis' type) as well as of other allied species of the genus, and have found in every instance the acetabula open ; Mr. Jacoby, whom I requested to examine the specimens in his collection, has found them in one solitary instance closed, but in all the rest open. It thus appears that open acetabula are the rule, and closed ones the exception in the present genus, and that *Ochralea* must be removed from the section in which it at present stands, and be placed near *Luperodes*, with which genus it becomes a question as to whether or not it ought to be amalgamated. As our knowledge of the *Galerucina* extends, it will, I think, be found that the open or closed states of the anterior acetabula have not the same primary importance in the arrangement of the family as that assigned to them by Dr. Chapuis ; as seen above, the acetabula in individuals of the same species vary from open to closed, whilst in some genera, *Syoplia*, *Metroidea*, and others, the anterior acetabulum is often closed on one side, and open on the other in the same individual; this being the case, it must sometimes occur that, relying on these characters alone, genera are established and closely allied species separated, on insufficient grounds. I draw attention to this to point out that, where practicable, a series of specimens should be examined and any deviation from the typical form be noted. Where the anterior coxæ are very prominent and the hinder margin of the acetabulum is very narrow (as frequently occurs), there is often greater difficulty in ascertaining the actual state of the cavity, without either removing the coxæ, or detaching the thorax from the rest of the body.

HISPODONTA PLAGIATA.

Ovata, depressa, sordide flava, nitida, antennis piceis; thorace quam longo dimidio latiori, lateribus rotundatis; disco basi et ad latera distincte punctato; elytris seriato-punctatis, utrisque vix pone medium plagâ magnâ, male definitâ, piceâ instructis. *Long.*, 5 *lin.*

Hab.: India; a single specimen in my collection.

Front excavated and coarsely punctured; vertex smooth, impunctate. Thorax one-half broader than long; sides rounded, the hinder angle with an obtuse tooth; disc smooth and nearly impunctate in front, its base, together with the sides, rather coarsely punctured. Elytra much broader than the thorax, rather strongly seriate-punctate.

Closely resembling the pale varieties of *H. janthina*, Bland., separated from that species by the much broader thorax, its sides at the same time being more regularly rounded than in that insect.

OXYCEPHALA WALLACEI.

Elongata, postice vix ampliata, modice convexa, nigra, nitida, elytris flavo-fulvis, apice late nigro-cyaneis. *Long.*, 7 *lin.*

Hab.: Solomon Islands.

Face strongly produced between the eyes, armed just below the antennæ with an obtuse tooth; antennæ rather less than half the body in length, filiform, slightly compressed towards the apex. Thorax longer than broad; sides straight and parallel from the base to beyond the middle, then abruptly contracted to the apex; upper surface sub-cylindrical at the apex, flattened posteriorly, strongly punctured, middle disc deeply foveolate on either side; extending from the apex nearly to the base, but narrowed posteriorly, is a smooth, impunctate space; sides within the lateral margin deeply excavated and coarsely punctured. Elytra regularly punctate-striate; each elytron with four elevated costæ, the third from the suture obsolete on the anterior half of the disc.

The elongate thorax will at once separate the present species from *O. speciosa*, Boisd.

The Butts, Warwick:
March, 1887.

NOTES ON SOME HABITS OF *SPHECODES*, LATR., AND *NOMADA*, FAB.

BY R. C. L. PERKINS.

During the past summer I spent many hours in localities where the genus *Sphecodes* is well represented, both in number of species and of individuals, and, consequently, had excellent opportunities of studying some of their habits.

Towards the end of April (about a fortnight after the re-appearance of *Halictus*) the hibernated and impregnated females appear abroad, and may be met with abundantly until quite the end of June; in fact, old and battered examples are still to be found when the first males begin to emerge.

These females may generally be found flying along hard-trodden pathways and dry banks, especially those which are entirely, or in part, denuded of grass and herbage. They appear indifferent as to the nature of the soil, whether clay, sand, or gravel; possibly, however, some species are found more abundantly on one soil than on another. I have found *S. ferruginatus*, Schenck, *hyalinatus*, Schenck, and *variegatus*, Von Hag., far more abundant on clay than elsewhere. They usually settle on the bare ground, particularly on light-coloured stones, or often on a piece of paper, china, or any other white object, on which, if not approached too closely, they may be watched basking in the hottest sunshine. They run along the ground with speed, much in the manner of a *Pompilus;* they resemble the sand-wasps too, in their habit of exploring every crack and inequality they meet with, and this habit is more especially marked in some of the smaller species of the genus. I should doubt if they ever go far from their breeding-place, but fly up and down just above the surface of the ground in its immediate vicinity.

Of the very numerous spots in which I have observed them breeding, nearly all have been occupied also by a colony of some species of *Halictus;* and, what is still more suggestive, where the *larger* species of *Sphecodes* breed, there will be found a colony of one of the *larger Halicti*, and the *smaller* species of the one genus will be found with the *smaller* species of the other. For instance, I take *S. gibbus*, Linn., amongst *H. rubicundus*, Christ, and *S. subquadratus*, Smith, with the same species; *S. dimidiatus*, Von Hag., with *H. nitidiusculus*, Kirb.; *S. affinis*, Von Hag., with *H. tumulorum*, Linn.; but I do not mean to say that the above associations are universal or strictly adhered to, for *S. gibbus* may be found with *H. leucozonius*, Schr.; *S. subquadratus*, Smith, with *H. cylindricus*, Fab.; *S. affinis*, Von Hag., with *H. nitidiusculus*, Kirb., and *H. morio*, Fab.

All round Oxford the stone walls are often covered on the top with mud scraped from the road side. In the mud on one of these a colony of *H. rubicundus*, Christ, was established, occupying a length of a yard or so; in this small space, however, were crowded hundreds of burrows, and amongst the scores of the *Halictus* that were entering these, laden with pollen, now and then a specimen or two of *S. gibbus* would be seen hovering around, or going in amongst them. And yet there were dozens of yards of wall, with mud exactly similar, equally in the sunshine, and quite unoccupied.

This same species (*S. gibbus*) was chief actor in a scene far more interesting. On the 9th of last June, on a hard sandy pathway, I saw a female, as it seemed at first sight, digging a burrow. Soon, however, it appeared to me to be enlarging the opening of one already formed. Its head was hidden in this opening, and with its head in this position it would now and then turn slowly round in a circle. I may here say that I had placed my net over it, and was watching it through this, but it took no notice—probably it was too much occupied otherwise. Presently it retreated backwards an inch from the opening, when, to my surprise, I saw another bee a short way down the burrow. This afterwards proved to be a worn ♀ of *H. leucozonius*. The *Sphecodes* now made a rush down the burrow, and set to work attacking the tail of the *Halictus* with its mandibles. Again the former left the burrow, and was this time followed by the other. But now finding themselves prisoners, their only thought was of escape, so I was unable to see what would have been the end of the struggle.

As to the flowers which these females visit, I have only seen them myself once or twice on the common daisy, and once on the blossom of the whitethorn, but from their love of settling on other white objects (as mentioned above) I am inclined to think that in these instances it was only for the purpose of sunning themselves.

Several of the facts I have mentioned would seem to point to the genus being parasitic on *Halictus*, but the weight of evidence seems in favour of its being non-parasitic. It is difficult to see how the point can be proved, except by rearing them from the burrow, though, possibly, it may have been settled by some Continental Hymenopterist.

As to battles between host and parasite, Shuckard mentions them between *Anthophora* and *Melecta*, and *Colletes* and *Epeolus;* these I have had no chance of seeing, but what is more curious, I have seen two females of the Fossor, *Agenia variegata*, Linn., fight with the utmost fury, the one having entered the other's burrow.

So far, I have been speaking solely of the hibernated females; what follows refers to the brood sprung from these.

About the middle of July the first males appear, and continue on the wing until nearly the end of September. They may be found abundantly on flowers in the vicinity of their breeding-place, but often wander to some distance, so that stragglers may be found in most unlikely places.

They may sometimes be taken by scores off *Carduus arvensis*, various *Umbelliferæ*, and *Achillea millefolium*, and less abundantly on *Senecio*, *Crepis*, *Centaurea*, *Rubus*, and many other flowers.

In a few days the fresh females emerge. They are, comparatively speaking, rarely seen on flowers, and, probably, as a rule, retire to their winter quarters almost directly after impregnation. None of the *Bombyces* amongst *Lepidoptera* have greater powers of attraction for the males than these. Often a dozen of the latter may be seen buzzing round some tufts of grass, amongst the roots of which the female will often be found. Nor does the attraction cease even with death. For if a freshly-killed female be placed upon the ground, the males will not be long in finding her out, and this is a sure way of getting the former correctly named, as the latter sex affords much clearer specific characters. Indeed, they are so bold, that one day on turning out some dozen specimens from a killing-bottle into my hand (although at the time I was sitting under a tree, and quite in the shade), a male was attracted, settled on my hand, and walked about over the heap, nor was it frightened away, until I had twice attempted to catch it with my other hand.

There would seem to be some peculiarity with regards to the economy of some of those species of *Nomada*, which are parasitic upon *Halictus*. For whereas *N. Fabriciana*, Linn., *N. flavoguttata*, Kirb., and *N. furva*, Panz., appear in April or May, and are found in June (*i. e.*, are on the wing when the *Halicti* with which they breed are provisioning their nests and depositing their eggs), *N. solidaginis*, Panz., *N. jacobææ*, Panz., and others appear with the fresh brood of *Halictus* in July and August, of which the females hibernate and deposit eggs in the spring. To continue the race it would appear necessary for the females of these *Nomadæ* to follow their example—but do they do so?

With regard to *N. Fabriciana*, Linn., though common, it is an interesting species. Generally, I have found it abundantly infesting colonies of *Halictus rubicundus*, Christ. Mr. Saunders, in his Synopsis, says that, probably it is parasitic on *Andrena Gwynana*, Kirb., and double-brooded like its host. This I have found to be the case; the second brood, however, are much less plentiful and darker in colour. I found a few at Oxford, and the only species that appeared with it, that it was likely to infest, was the scarce *Andrena angustior*, Kirb. F. Smith and Shuckard both took it at Hampstead infesting *Panurgus ursinus*, Gmel., one of the *Apidæ;* the latter in fact says that it is restricted to this species.

Sopworth Rectory, Chippenham:
January, 1887.

VARIABLE MOULTING IN *ORGYIA*.

BY PROF. C. V. RILEY, M.A., F.E.S.

Dr. T. A. Chapman's remarks on the moulting of the larva of *Orgyia antiqua* (March number) have just fallen under my notice. It may interest him to know that in 1868 I called attention to the fact that the male larva of *Orgyia leucostigma* undergoes one moult less than the female larva (First Report on the Insects of Missouri). The variation from the normal number of moults (3 for ♂, 4 for ♀), noticed by him in *antiqua*, has also been noticed in *leucostigma* since the publication of the report referred to. As to some of the questions which Dr. Chapman raises, I would say that a pretty extensive experience in rearing larvæ of all Orders leads me to the conclusion that there is a very general tendency in individuals to vary from the normal number of moults in the species; that whenever there is much discrepancy in the size of the sexes, the smaller (usually the male) undergoes a less number of moults (universal, I believe, in the *Coccidæ*), and that the variation in number of larval moults, except where, as in these cases, it is sexual, and presumably predetermined in the egg, is dependent on food-supply rather than hibernation. In frequent-moulting species like *Tenebrio* and *Dermestes*, I have shown by experiment* that there is a relation between scarcity of food (and consequent retardation in development) and increased number of moults, and think it may be stated as a very general rule that moulting is correlated with rate of growth and nutrition, those species which have a short larval existence, generously nourished, exuviating least. A rule applying to the class is presumably applicable to the individual.

Newton, Kans., U. S. A.:
March 21*st*, 1887.

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* See Ann. Rep. U. S. Entomologist for 1885, and *Am. Naturalist*, about 1883. I write on a Pullman, *en route* for California, else would give specific references.

OCCURRENCE IN DORSETSHIRE OF *BUTALIS SICCELLA*, ZELLER, A SPECIES NEW TO BRITAIN.

BY E. R. BANKES, M.A., F.E.S.

I have much pleasure in recording the addition to the British list of this obscure but interesting little *Butalis*, which I was fortunate enough to meet with near Weymouth in the end of June of last year (1886). Not long previously, Mr. C. W. Dale happened to mention that some years ago he had taken *B. variella* in that locality, whereupon, although he had no doubt about the identity of the species, I determined to investigate the matter, for I knew that *Erica cinerea*, upon which we find the larva of *B. variella* in this district, did not grow in the neighbourhood. Accordingly, towards the end of June, I went down, accompanied by Mr. Dale, to search for the insect, and was fortunate in meeting with specimens of a *Butalis*, which struck me at once as being very different from the typical *B. variella*, and which have lately been identified by Mr. H. T. Stainton as *B. siccella*, Zeller.

This species is described by Professor Zeller in the "Linnæa Entomologica," x, 257, and it may be interesting to quote the remarks he there makes about it, as compared with the closely allied *B. variella*.

> "Although very variable, this species appears to be specifically distinguished from *variella* by the anal tuft of the male, which is stouter, and has the appearance of being cut off straight behind ('den stärkern, hinten grade abgeschnittenen Afterbusch'). The more obtuse form of the fore-wings, and the blackish upper surface of the abdomen, must also be considered as affording additional points of distinction.
>
> "*Siccella* is, as a rule, smaller than *variella*, yet, especially in the female sex, it does attain to the size of the smallest specimens of the latter. . . . . .
>
> "Fore-wings shorter than in *variella*, and, owing to the greater density of the fringes, appearing less sharply pointed; the ground-colour darker, yellowish-brown, the white scales being sparingly scattered over the surface: the quantity of these scales varies greatly, but does not cause the ground-colour to appear paler: these scales accumulate at the apex, and here generally form a whitish spot—sometimes, however, they are entirely absent.
>
> "The fold is black; beyond the middle lies a white dot composed of a few scales; between this and the base there is generally another dot, variable in size, and sometimes larger than the former. At the extremity of the fold there are only scattered white scales, which do not form a spot.
>
> "At Glogau *siccella* is not rare in sandy Scotch-fir woods in June. It flies in the sunshine, frequenting flowers, and, in company with *cicadella*, visits those of *Jasione montana*. I have also taken it on the flowers of *Potentilla argentea*. . . . ."

Von Heinemann considers *B. siccella* as only a variety of *B. variella*; but Snellen, writing at a later date, keeps them separate, and there can be but little doubt that they are really distinct.

B. siccella (alar. exp., $3\frac{1}{2}'''$—$4\frac{1}{2}'''$) may be distinguished from *B. variella* (alar. exp., $4\frac{1}{2}'''$—$5'''$) by its smaller size, shorter wings, stouter and darker abdomen, and, so far as my observation goes, by its uniformly darker colour. The specimens which I took are all very dark, and have fewer white scales and light markings than any *variella* I have ever met with; they seem to vary but slightly, whereas in *B. variella* there is every possible variety from very pale grey down to nearly black.

The habits of the two insects are apparently precisely similar, as they both skip along with short jerky flights over the scant herbage or bare sand in the hot sunshine.

I hope to meet with the larva of *B. siccella* shortly, as at the time I took the imago it struck me that *Thymus serpyllum* would very possibly prove to be its food-plant, and this surmise is rather confirmed by the following remarks of Tengström, who writes:—

"The little moth is *Chrysesthia siccella*, Zell., a Butalid of which the disproportionately long, pale steel-grey, larva lives in sand-tubes several inches long, both under *Thymus* and under *Empetrum*, and in astonishing multitudes. From the middle of June to the beginning of July one can find everywhere about, where these plants grow on the open loose sand, not only the perfect insects, but also the larvæ and pupæ of this moth in infinite numbers."

I am greatly indebted to Mr. Stainton for his kind help in identifying this species, and also for the above extracts from the works of Zeller and Tengström.

The Rectory, Corfe Castle:
March 18*th*, 1887.

Notodonta torva, Hüb., in Great Britain.—When recently looking through the collections of Mr. F. Norgate, of Downham, near Brandon (formerly of Sparham), he drew my attention to a moth which he had placed, with doubt, in his series of *Peridea trepida*. This I recognised as *Notodonta torva*, Hüb., and a subsequent comparison with a continental specimen removed all doubt about it. It was reared by Mr. Norgate from either egg or larva found by him in North Norfolk, probably in July or August, 1882; but as the ova found then hatched into what were supposed to be blackish varieties of the larva of *N. ziczac*, no record was kept sufficient to distinguish them from his other *Notodonta* larvæ, which others were all taken also in the same division of Norfolk. He found the supposed eggs of *N. ziczac* on aspen (*Populus tremula*) in July, and on Canadian poplar (*Populus balsamifera*) in August of that year. Both produced very dark larvæ similar in shape to those of *ziczac*, and it was most probably from one of these that *torva* appeared. Unfortunately the pupa was not separated from others of the same locality. He had no larvæ nor pupæ of *Notodonta* from any other locality that year, and is quite certain that this *torva* was reared from an egg or larva of his own taking in Norfolk.

This is one of the finest additions that has been made to the British list for many years. It is not unlike *Peridea trepida* in general appearance, but may at once be separated from it by the *generic* character of having *hairy eyes*, those of *trepida* being smooth and bright. Its fore-wings are shorter than those of *trepida*, but nearly as broad, of a dull grey with a faint under shade of yellowish. The two transverse lines are of a darker grey, and they *very nearly meet* on the dorsal margin just behind the "prominent" tuft. Between these lines is an indistinct lunule in a paler spot. Hind-wings grey. Antennæ reddish. It is the largest European species in the (restricted) genus *Notodonta*, and is widely distributed in Europe. Its larva feeds in September on aspen (*Populus tremula*), and is scarcely to be distinguished from that of *N. ziczac*. It was formerly placed in the list of reputed British species, but no reliable record of its previous occurrence in this country seems to exist.—CHAS. G. BARRETT, King's Lynn, Norfolk: *April* 15th, 1887.

Aporia cratægi in England in the last century.—I find Albin, 1720, has this species in his second plate, without any note of its being a rarity; he also gives a reference to Ray, Hist. Insect., p. 115, n. 5;* its continuance, therefore, in this country has been of some duration, and must have covered many cycles of favourable and unfavourable seasons.

I am inclined to think that when persistent and unlimited "collecting" comes to the aid of bad weather, the chances of the survival of a large day-flying species must be a good deal diminished. The protection of "small birds" must have some influence in such matters.—J. HELLINS; Exeter, *March* 31*st*, 1887.

Aporia cratægi in Devonshire.—As to queries inserted in the last number of Ent. Mo. Mag., respecting *Aporia cratægi*, whether it is indigenous to Devon or not, I have stated in my Fauna of Devon, Section *Lepidoptera*, p. 13, exceedingly local and rare, and, so far as I can learn, the only spot known for this species in the west is Moreton Hemstead. In an annotated copy of Turton and Kingston's Natural History of the District, in the hand writing of its late owner, R. T. Abrahams, Esq., it is stated, "taken by Mr. Williams near Moreton Hemstead." This must have been at least forty years ago. I have myself been a collector of all orders of insects in Devon since the year 1849, and not a single specimen has fallen under my observation during this time, neither have I heard of one being taken in any part of the county. From this I infer that this species is not indigenous in Devon, but that it is an immigrant from the continent.—EDWARD PARFITT, Exeter: *April* 4*th*, 1887.

Pedigree Moth-breeding.—Touching the interesting experiments suggested by Mr. Galton, and the views expressed on p. 238 of the March (1887) number, I would second Mr. McLachlan's recommendation of the common *Sericaria mori*. It has

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[* Ray's Historia Insectorum, a posthumous work, published in 1710, only enumerates the insect, without saying whether common or otherwise, nor does it give any localities. Moses Harris, in his Aurelian, published in 1766, says of this insect: "They fly in meadows near corn-fields, and, as they do not fly very fast, are easily taken in your net." He mentions no localities, but after describing the habits of the larvæ he says, when they are nearly full-fed: "Now is the best time to take them, they being easily seen on account of their size, as they lie on the web together, which they do not forsake till they go in search of a convenient place for their change." So that even in those days the gregarious larvæ and the slow-flying butterflies were only likely to fall too easy a prey to the picture-making collectors of insects.—EDS.]

already produced a large number of well marked races, the crossing of which will facilitate the experiments, while its domestic habits, and the ease with which its feeding and reproduction are controlled, rank it above all other insects for this purpose. Moreover, it shows a convenient tendency to vary under new conditions; for I have never conducted an *education* without noticing individual variation from the typical characteristics, whether as to colour of larva, cocoon or imago, or whether as to number of annual generations. The tendency from monogoneutism to bigoneutism, or (to borrow the French terms) from *annuels* to *bivoltins*, is, in fact, quite annoying in the States south of 38°. Yet, in the past sixteen years, I have, by selection, been able to sufficiently fix the characters of a Maclura-fed strain (originally a cross between a French yellow and a Japanese white) that it is quite at home on its new food-plant, and shows little tendency to vary in the character of the cocoon.—C. V. Riley, Topeka, Kans, U. S. A.: *March* 21*st*, 1887.

Obituary.

John Sang was born at Darlington, on the 3rd March, 1828. As a boy at school he bore an excellent character, and as a reward for a feat of memory in reciting a small English History, he was taught French, and afterwards Latin, free. His knowledge of these languages, thus early acquired, proved afterwards of the greatest use to him in his pursuit of his favourite study, Entomology, and later in life he learnt German in order to extend his knowledge. In his boyhood he was very fond of drawing and painting birds and insects, some of his earliest paintings showing great skill. In 1843 he was apprenticed to a draper at Wakefield, where the seeds of his love of music and entomology were sown. He used frequently to speak of the great delight he experienced in seeing the collection and grounds of the late Charles Waterton. It was during the six years he spent at Wakefield that he commenced collecting butterflies, and here in 1848 he had the gratification of capturing a specimen of *Chœrocampa celerio*. In 1849 he removed to Manchester, and there began the more thorough and scientific pursuit of Entomology, and formed the nucleus of what was destined to become a very extensive collection. After leaving Manchester he returned to Darlington, succeeding to his father's business in High Row. His earliest communication to any of the Magazines seems to have been that sent to the Zoologist, June 23rd, 1853 (Zool., 1853, p. 4001), on the occurrence of *Psecadia funerella* at Richmond, Yorkshire, and *Hypercallia Christiernana* at Castle Eden. His next notice appeared four years later in the Entomologists' Weekly Intelligencer (II, 75), on the occurrence of *Lithocolletis vacciniella* at Harrogate, and thenceforward his published notices were numerous. He was one of the first captors, in this country, of *Miana expolita*, Doubleday (now referred to *captiuncula* of Treitschke). In 1860 he took a new *Gelechia*, *intaminatella*, which, in 1866, he bred from *Lotus corniculatus*. From the same plant he also bred, in 1866, *Gelechia Sangiella*, a new species which had been named after him, he having first captured it in 1862 on the railway bank near Darlington. Another new *Gelechia* captured by him in salt marshes near Redcar was described in October, 1885, under the name *tetragonella*. He had retired from business, and was employed pretty constantly with Entomology in one way or other, having commenced to depict with care and accuracy the various species in his collection—not being deterred from attacking in this way even the smallest *Nepticulæ*; when an event occurred, which changed the even tenor of his life. He had become security for a friend, and owing to the friend's failure, he had to raise a large sum in cash; to do this there was no alternative but to part, amongst other things, with his collection, which was sold in June, 1882. His perfect equanimity during that trying period was so remarkable that it must of necessity, in any notice of him, be mentioned with the greatest respect. Not in any way did he betray that he felt himself a sufferer. He had thought of resuming business in a subordinate capacity, but his entomological talents were too great and too highly appreciated to admit of their being thus lost to science. And in the occupation of Curator of an extensive private collection (Dr. Mason's), and delineator of insects, he passed the remainder of his days. His botanical knowledge was very extensive, and he had a great taste for music, officiating for many years as an Honorary Organist, and he was one of the originators, and for 19 years the Secretary, of the Darlington Choral Society. John Sang was never married. A notice of his sudden death, and its cause, appeared in our last No. (p. 261).

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY: *March* 24*th*, 1887.—R. ADKIN, Esq., F.E.S., President, in the Chair.

Messrs. J. Stringer and J. W. Slater were elected Members.

Mr. J. A. Cooper exhibited a variety of *Cidaria immanata*, Haw., from North Devon. Mr. Carrington remarked that this form was found not uncommonly in the mountains of Scotland, and he believed the larvæ fed on bilberry. Mr. Cooper also showed a specimen of an ichneumon bred from a pupa of *Sesia sphegiformis*, Fb. Mr. T. R. Billups exhibited *Stilpnus deplanatus*, Gr., bred from the larva case of a species of *Psyche* found on a fence in his garden at Peckham, also *Apanteles tetricus*, Reinh., bred from the common thrift (*Armeria maritima*, auct.), found in the Warren, Folkestone.

At the close of the ordinary business, there was an Exhibition of Microscopical Objects. Mr. Tutt showing wings of *Lepidoptera*, prepared and mounted by Mr. Coverdale and himself; Mr. W. West, of Streatham, eyes of spider, &c.; Mr. Dadswell, botanical objects; Mr. Macer, *Vespa vulgaris*, &c.; and Mr. Medland, proboscis of blow fly, &c.

April 14*th*, 1887.—The President in the Chair.

Mr. J. A. Cooper exhibited bred specimens of *Amphidasys strataria*, Hufn. Mr. C. A. Briggs, a large number of *Lycæna bellargus*, Rott., including many forms both of the male and female dwarfed forms, and some remarkable varieties of the under-side; also another box containing a pale yellow variety of *L. Ægon*, L., and varieties of the under-side of *L. Icarus*, Rott., and *L. Astrarche*, Bgstr. Mr. Adkin, larvæ cases of the Tortrix *Eupœcilia ambiguella*, Hb. Mr. Billups exhibited the following *Coleoptera*: *Megalosoma typhon* from Chili, *Xylotrupes Gideon* from the West Indies, *X. dichotomus* from the Phillipine Islands, *Golofa centaurea* from West Africa, *G. hastatus* from Mexico, and *G. alacus* from Columbia; also three specimens of the rare Lamellicorn, *Phœneus imperator*, Fab., from Chili, and contributed remarks. Mr. Goldthwaite showed living larvæ of *Pericallia syringaria*, L. The Secretary read a letter from Mr. W. F. de V. Kane in respect of a sound-producing Lepidopteron which a friend had taken in the Gerakhpur Woods, India. Mr. T. D. A. Cockerell read a paper on "Variation."—H. W. BARKER, *Hon. Sec.*

Entomological Society of London: *April 6th*, 1887.—Dr. David Sharp, F.Z.S., President, in the Chair.

Mr. Francis Galton, M.A., F.R.S., of 42, Rutland Gate, S.W.; Mr. John Henry Leech, B.A., F.L.S., of 10, Hyde Park Terrace, W.; and Mr. George S. Parkinson, of Percy Cross, Fulham, S.W.; were elected Fellows.

Mr. Samuel Stevens exhibited specimens of *Arctia mendica*, collected in Co. Cork, by Mr. McDowall, of Manchester. The peculiarity of the Cork form is that the majority of the males are as white as the female of the English form.

Mr. McLachlan exhibited a zinc box used by anglers for the purpose of keeping living flies in, which he thought might be adapted to practical entomological use in the field.

Mr. George T. Porritt exhibited a large number of specimens of *Hybernia progemmaria*, bred from moths collected at Huddersfield last spring. All the females and a large proportion of the males were of the dark variety *fuscata*, which, formerly, was almost unknown in Yorkshire, but which now seemed likely to replace the paler and original type. Mr. Jenner Weir and Lord Walsingham both remarked that the number of melanic forms appeared to be on the increase in the north.

Mr. Gervase F. Mathew, R.N., exhibited several new species of *Rhopalocera* taken by him in the Solomon Islands, during the cruise of H.M.S. "Espiegle" in 1882 and 1883.

Mr. E. B. Poulton exhibited a large and hairy Lepidopterous larva—apparently of a *Bombyx*—brought from Celebes by Dr. Hickson, and made remarks on the urticating properties of the hairs of the species. Lord Walsingham, Mr. McLachlan, Dr. F. A. Dixey, Mr. Jenner Weir, Dr. Sharp, Dr. Slater, and Mr. Poulton took part in a discussion as to whether urtication was due to the mechanical action of the hairs, or to the presence of formic acid, or some other irritant poison, in glands at the base of the hairs. There appeared to be no doubt that in some species the irritation was merely due to mechanical action.

Mr. P. Crowley exhibited a collection of *Lepidoptera* recently received from West Africa.

Mr. H. Goss announced the capture by Mr. G. D. Tait, at Oporto, in September last, of a specimen of *Anosia Plexippus*, and remarked that only two specimens had been previously recorded from the Continent of Europe.

Lord Walsingham read a paper entitled "A Revision of the Genera *Acrolophus*, Poey, and *Anaphora*, Clem.;" and he exhibited about twenty new species of these and allied genera. The paper was discussed by Mr. Stainton, Mr. McLachlan, Mr. Champion, and Dr. Sharp.

Mr. Poulton read "Notes in 1886 on Lepidopterous Larvæ, &c." In the discussion which ensued, Lord Walsingham referred to instances of protective resemblance in larvæ, and alluded to the existence in certain species, especially of the genus *Melitæa*, of prothoracic glands. Further instances of protective resemblance were cited by Mr. Jenner Weir. Dr. F. A. Dixey remarked on the extraordinary powers of contraction which appeared to be possessed by the retractor muscle of the flagellum in *D. vinula*. The discussion was continued by Mr. Gervase Mathew, Mr. W. White, Dr. Sharp, Mr. Porritt, and others.—H. Goss, *Hon. Secretary*.

END OF VOL. XXIII.

THE

ENTOMOLOGIST'S MONTHLY MAGAZINE:

CONDUCTED BY

C. G. BARRETT, F.E.S.
R. McLACHLAN, F.R.S.
J. W. DOUGLAS, F.E.S.
E. SAUNDERS, F.L.S.
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H. T. STAINTON, F.R.S.

VOL. XXIV.

> Nunquam aliud natura, aliud sapientia dicit.
> *Juvenal.*

248871

LONDON:
GURNEY & JACKSON (MR. VAN VOORST'S SUCCESSORS).
1, PATERNOSTER ROW.
1887-88.

LONDON:

NAPIER, PRINTER, SEYMOUR STREET, EUSTON SQUARE.

MDCCCLXXXVIII.

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THE
Entomologist's Monthly Magazine
VOLUME XXIV.

CONCERNING *BRACHYSCELIS MUNITA*, SCHRADER, AN AUSTRALIAN GALL-MAKING COCCID.

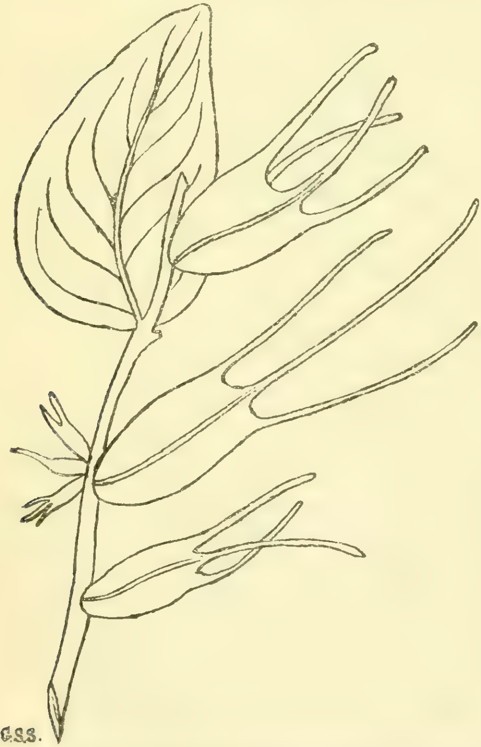
BY THOS. H. HART

(WITH PREFATORY NOTES BY R. McLACHLAN, F.R.S.)

[In this Magazine, vol. xvii, pp. 146, 147, December, 1880 (and also in other publications), I figured and noticed an extraordinary gall on *Eucalyptus*, forwarded by Baron von Mueller, and attributed to the *Lepidoptera* on the authority of larvæ in fluid said to have been extracted from similar galls. I also noticed what was supposed to be an undeveloped Lepidopterous chrysalis in a dried form found in the galls sent. A short time ago Mr. W. R. Jeffrey sent some sketches of similar galls made by his friend Mr. Hart, of Adelaide, and which the latter attributed to a species of *Coccidæ*, and I asked him to obtain further information. This has come in the form of a letter, from which the following extracts have been made, and an excellent figure by Mr. Hart, partially reproduced here for comparison with the figure on p. 146, vol. xvii. The error as to the position of the gall-maker was induced by Baron von Mueller's erroneous association of Lepidopterous larvæ with the galls, and it is somewhat singular that in these days of keen criticism no one has, until now, referred to the paper by Schrader ("read" June 2nd, 1862), in which, in all probability, the same insect and gall are noticed and figured, any slight differences in the form and size of the galls *may* be due to differences in the species of *Eucalyptus*, or to the age of the galls. Mr. Hart's figure is reproduced mainly because it possibly indicates the galls of the male in the smaller examples. But some of Schrader's galls were enormous, for he says he found one *eleven inches* long, and his figure indicates the horns as longer and less incurved at the tips than does mine of 1880, and in this respect Mr. Hart's figure is somewhat intermediate. These gall-making Coccids (Fam. *Brachyscelidæ*, Signoret) seem peculiar to Australia, and possibly also to *Eucalyptus*, and are no doubt numerous in species. I am indebted to Mr. Jeffrey for permission to use the drawing.—R. McLACHLAN].

"Since receiving your letter of November 24th I have done all that my unsatisfactory state of health would admit to clear up the mystery of the long-horned gall of the gum trees. In the first place I made enquiries at the Public Library here for any literature on the subject, but the only assistance the attendants could give me was to point out a paper by H. L. Schrader in the first vol. of "The Trans. of the Ento. Soc. of New South Wales," entitled, "Observations on certain Gall-making *Coccidæ* of Australia." The paper is illustrated by three plates, and, to my surprise, on one of them I found a figure of our particular gall, with the name "*Brachyscelis munita*," Sch., attached.

"And now for private observations. Few observers seem to have seen the male Coccid; but, as far as I can gather, it is of the normal size and winged, and would appear to be bred from the *small* galls that are almost always found in company with the large ones. As the helpless female never leaves the gall, pairing must take place through the small orifice in the gall between the horns. Whether the eggs are expelled from the body of the female, or whether her dead skin (she is simply an egg-sac) still encloses them as a means of protection, does not seem clearly determined, but it is said the newly-hatched young emerge from the orifice and scatter in search of food. I have met with no one who has observed the galls at an early stage. I see I have omitted to say above that the female is from half to three-quarters of an inch in length, and is incapable of any movement but that of a wriggle of the tail after the manner of a chrysalid.



"As to the galls themselves, the season has about arrived for obtaining them, and as I cannot get about in search of them, I have enlisted the services of my friend, Mr. R. H. Pulleine, and his brothers, who have undertaken to get me some specimens, but I have just received a note from the former saying that up to the present they had been unable to meet with it. Like some of the galls at home it seems to be abundant in some years and scarce in others, but I hope we shall be able to meet with it.

"The only explanation that occurs to me of the error into which Baron von Mueller was no doubt led by some non-entomological friend is this, that a moth had deposited her eggs upon or near a cluster of old and empty galls, and the young caterpillars had appropriated the galls to their own purposes. There are quantities of Lepidopterous larvæ under the dead bark or in chinks and cracks of every gum tree, and for many of the smaller kinds the cavity of the gall with the orifice enlarged would prove a very convenient place for pupation."

Adelaide: *March 23rd*, 1887.

ON A NEW GENUS OF *EROTYLIDÆ*.

BY GEORGE LEWIS, F.L.S.

In vol. xx of the Ent. Mo. Mag., p. 138 (1883), I described a species of the above Family as *Episcapha perforata*, but I find now, on a further study of the group and of three similar species from Japan, that the insect requires a genus to be formed for its reception. And I also see that the four Japanese species are congeneric with *Megalodacne Ulkei*, Crotch, and it is this last named species that I now propose to treat of as the type of the genus *Microsternus*.

The chief characteristics of *Microsternus* are, in the first place, the very narrow, almost inconspicuous, transverse mesosternum, and in the second the form of the prosternum. The prosternum is, as stated by Crotch (Trans. Amer. Ent. Soc., p. 353, 1873, as a specific character of *Megalodacne Ulkei*), raised and triangular. The narrow and transverse mesosternum of *Microsternus* points to an alliance with *Aulacochilus*, and so also does the form of the prosternum. The sternal plates of *Microsternus Ulkei* are represented here by fig. 1, and fig. 2, given for comparison, shows the outlines of *Aulacochilus violaceus*, Germ.

fig. 1

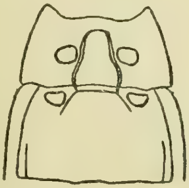


fig. 2

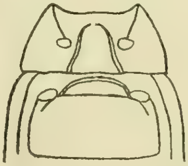
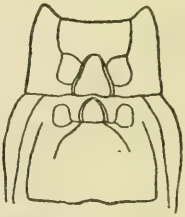


fig. 3



Megalodacne and *Episcapha* are closely allied genera, but both have a mesosternal structure which is conspicuous between the middle coxæ, and this character separates them in a very marked degree from

Aulacochilus and the present genus. The type of the genus *Megalodacne* is the species *fasciata*, Fab., and it measures 17 mm., and some of the species are larger. Fig. 3 represents the sterna of *Megalodacne bellula*, Lewis, from Japan. In *Microsternus* no species is known at present which measures over 7 mm., and 4 to 6 mm. is the average length of the individuals now under examination. There are lateral striæ on the prosternum of *Aulacochilus*, shorter or longer in various species, and in *algerinus*, Bedel, they converge at the apex, but in *violaceus*, Germ., the lateral striæ are interrupted as shown in the figure.

Of course the almost total disappearance of the mesosternum in *Microsternus*, and the comparative small size of it in *Aulacochilus*, are very important characters, and if systematists should hereafter consider this structure one of superior value for classification, it will be necessary to bring the genus *Erotylus* nearer to *Megalodacne*. At present *Aulacochilus* stands between *Megalodacne* and *Erotylus*, yet the last two alone have a conspicuous mesosternum.

Wimbledon: *April* 15*th*, 1887.

NOTES ON THE ENTOMOLOGY OF PORTUGAL.—IX. *EPHEMERIDÆ.*

BY THE REV. A. E. EATON, M.A., F.E.S.

This Family of insects has hitherto received no attention from Portuguese entomologists; and the species here noticed were captured for the most part on only chance opportunities. The list is, therefore, unduly short: for unless a collector can make it his business to visit suitable localities at the right seasons, and at times when the flies are on the wing (which can only be done where quarters are obtainable within convenient proximity to those places), he cannot thoroughly investigate the May-fly fauna of a country. Neither spiders' webs, nor nymph catching, can fully compensate for his absence during the hours of the flights. Some species, however, can be advantageously collected in sub-imago earlier in the day; and a netsman learns to value a lantern if he stays out until nightfall in mountainous districts.

Oligoneuria rhenana, Imh.—Nymph captured in the swift shallows above Ponte de Morcellos.

Ephemera glaucops, Pict.—A ♀ imago, caught in the evening at Saõ Marcos da Serra, was devoured by a moribund dragon-fly in the killing-bottle. There is a specimen from central Portugal in Lisbon Museum.

Leptophlebia, sp. ——?—Nymph in a hill-stream west of Villa Real, Traz-os-Montes.

Choroterpes Picteti, Etn. [the *Ch. lusitanica* of Ent. Mo. Mag., xvi, 194 (Feb., 1881)].—Nymph locally abundant in the main stream below Cintra, in April; nymph and fly common near Aldea das Neuves, Almodovar, the nymph harbouring under stones at the outflow of pools in the stream, where its identification was effected by means of the sub-imago in the afternoon; also common at fords crossed in the sierra between São Marcos da Serra and Almodovar.

Thraulus bellus, Etn.—Nymph local in the main stream below Cintra, residing under stones on fine gravel and sand near the edge, where the current is gentle, at the end of April. Fly found at the same place, in a spider's web, early in the morning, a month later.

Habrophlebia nervulosa, Etn.—Cintra, at the same stream as the preceding species, and also on the hill-top outside the palace grounds; also at similar altitudes near Silves and Ponte de Morcellos, and at higher elevations on Foia, the Estrella, and near Villa Real, Traz-os-Montes.

Calliarcys humilis, Etn.—Fly common on the northern slopes of Foia, at altitudes a little over 2000 feet, at the end of May, thronging in the shelter of bushes, and near the ground; captured also by beating *Erica* overhanging a stream on the Estrella, south of Sabugueiro, at an altitude of 4100 feet, early in June.

Ephemerella ignita, Poda.—The stream below Cintra, at the end of April.

Cænis halterata, F.—Fly captured at the same place and time, near a bridge, early in the morning. *C.*, sp. ——?—Nymph figured in Trans. Linn. Soc. (2) Zool., iii, pl. xlii, 3, caught at the same place.

Baëtis binoculatus, L.—Abundant lower down the same stream. *B. scambus*, Etn., ?.—A species, which may be this, was abundant at Cintra with the preceding; eight specimens from Cintra, Salamonde, and Silves stand together in McLach. Mus. *B. rhodani*, Pict., ?.—Three ♀ specimens from Foia may possibly belong to this species: the ♂ was not observed. *B. Bocagii*, Etn.—Captured, chiefly in sub-imago, along the streamlet between Alcantara and Bemfico, Lisbon. *B.*, sp. ——?—Five specimens, captured in the early morning in descending the opposite side of the hill above Cea in the Estrella, probably represent an undescribed species; two other specimens in McLach. Mus.—one from the Estrella, south of Sabugueiro, and the other from Caldas da Monchique,—are likewise of undetermined species. *B. pumilus*, Burm.—Common at Cintra; single specimens also were caught at Cea, in the Estrella, and near Villa Real, Traz-os-Montes.

Centroptilum luteolum, Müll.—Captured on the same occasion as *Cænis*. *C. pennulatum*, Etn., ?.—Two imagos at Ponte de Morcellos.

Cloëon dipterum, L.—A ♀ imago from a hedge in the vineyards under Cintra, by beating, and another in a house at Casevel Railway Station: the former specimen is lost. *C. simile*, Etn.—Slow and shallow streamlets at Almodovar, São Marcos da Serra, and Silves. *C. concinnum*, Etn.—In flight, shortly before sunset on June 1st, at the stream near Porcalhota, where the roads meet from Lisbon, Cintra, and Mafra.

Siphlurus flavidus, Ed. Pict. (*Baëtis flavida*, Ed. Pict.). ?—Nymphs, very probably, of this species (figured in Trans. Linn. Soc. (2) Zool., iii, pl. L, 2, 3, and 20—26), were plentiful in a small stream by São Barnabe, a hamlet near the sierra south-west of Almodovar: they match Pictet's species in size; the fly had begun to emerge early in May, although none were seen, for a few empty nymph-skins were clinging to stones in the water a little above the surface.

Epeorus sylvicola, Ed. Pict. (*Baëtis sylvicola*, Ed. Pict.; *Epeorus geminus*, of Trans. Linn. Soc. (2) Zool., iii, 238).—In flight, at 10.30 a.m. on June 7th, over a stream in the Estrella, south of Sabugueiro, at an altitude of 4200 feet.

Rhithrogena aurantiaca, Burm.—A ♀ imago at Ponte de Morcellos; other species of this genus no doubt occur in the Estrella, but none of the most likely streams were visited in the evening, being far from Cea.

Heptagenia sulphurea, Müll.—Ponte de Morcellos; the specimens have been noted as a *variation* in *op. cit.*, p. 270.

Ecdyurus fluminum, Pict.—A ♀ sub-imago from the stream flowing south of Monchique was captured on May 19th.

This list is based almost entirely upon specimens now in the collection of Mr. R. McLachlan.

Lyme Regis: *March* 11*th*, 1887.

OCCURRENCE OF BOTH *STEGANOPTYCHA PYGMÆANA*, HB., AND *S. ABIEGANA*, DUP., IN ENGLAND, AND THE LATTER SPECIES IDENTIFIED AS THE *TORTRIX SUBSEQUANA* OF HAWORTH.

BY WILLIAM WARREN, F.E.S.

In vol. ii, p. 207, of the Manual, Mr. Stainton describes an insect, *Asthenia pygmæana*, as follows:—

> "Fore-wings *glossy*, pale grey, with reddish-brown markings; ocellus edged with silvery, *enclosing three longitudinal black lines*; hind-wings with the base pearly-white. Two specimens formerly in Haworth's collection; locality unknown."

I am not aware that any more specimens of the insect were taken until a few years since, when Mr. Boden came across them somewhere in the London district; of these insects I possess a pair.

A fortnight or so ago, a friend showed me on his setting-board three *Tortrices* which he had lately taken, and made out from the description in the Manual to be *pygmæana*, "*except that the ocellus had no black lines*." On comparing one of these insects with those captured by Mr. Boden, it was at once evident they were distinct species: Mr. Boden's being *abiegana*, Dup.; the others, *pygmæana*, Hb.

Of *pygmæana* a very accurate description is to be found in Snellen's De Vlinders van Nederland, p. 342, and in Ratzeburg's Forst-Insekten, p. 226, who also figures the insect in all its stages, T. 12, fig. 9. Both species are described in Heinemann, p. 217, and by Herrich-Schäffer, iv, p. 281, who also figures *abiegana*, fig. 128.

I give here a short description of each:—

Pygmæana, Hb.—Fore-wings greyish-brown, with a few rust-coloured scales intermixed, especially towards the hind-margin. Markings dark blackish-brown; basal patch with its outer edge consisting of *two distinct curves*, which at their junction in the middle form *a conspicuous angle*; central fascia of *nearly uniform width throughout*, with, on its outer edge, *a sharp angle*, corresponding to that of the basal patch, and more or less interrupted in the centre by grey and rust-coloured scales. Ocelloid patch with very faint lustrous margins, filled up with rusty-grey scales, *without any black lines.*

The costal geminations *indistinct*, dull lustrous. Cilia dark grey, *paler at the anal angle*; with a distinct sub-apical spot, which intersects the basal line, and is sometimes visible also in the apices of the cilia.

Head, thorax, face, and palpi *dark* fuscous; abdomen *dark leaden-grey.*

Hind-wings white, with the base and all the margins, especially towards the apex, broadly grey-brown.

Abiegana, Dup.—Fore-wings grey-brown, tinged with rusty-brown; markings dark brown. Basal patch with its two arms *not curved*, the upper slanting obliquely outwards, the lower vertical, forming only *a rounded or obtusely angled projection* where they meet; central fascia *narrow on the costa*, broadening towards the anal angle, *with only a rounded projection* on its outer edge, as in the basal patch, and *uninterrupted* in the middle. Ocelloid patch with distinctly lustrous margins, filled up with black lines, which, in the ♀, are contiguous; costal geminations *distinct, bright.* Cilia grey; the pale spot below the apex very indistinct, scarcely ever interrupting the basal line.

Head, thorax, face, and palpi *pale fuscous*; abdomen light grey.

Hind-wings whitish (thus not so white as in *pygmæana*), with the veins and margins light grey.

Pygmæana is a smoother, rather duller-looking insect, with straighter costa, and, therefore, narrower and more elongate-looking wings, with a more oblique hind-margin, not indented below the apex, as that of *abiegana* is to a slight extent. Heinemann gives 2½‴—2¾‴ as the length of the fore-wings in each species; Herrich-Schäffer says *abiegana* 5‴—5½‴; *pygmæana*, 5‴. Judging from what few specimens I have seen at present, I should consider *pygmæana* slightly larger on the whole than *abiegana.*

The question then arises whether Haworth's two specimens, from which, I expect, Wilkinson's and Stainton's descriptions were taken, were really *pygmæana*, or were not rather *abiegana.* The "three longitudinal black lines of the ocellus" can certainly only belong to *abiegana*, which is also more "glossy" than *pygmæana.*

An examination of one of Haworth's original specimens, still extant in the collection of the British Museum, satisfies me that his species was really *abiegana*: this is fully confirmed by his description of *subsequana*, p. 448:—

"*Alæ anticæ griseæ, magis lucidæ, longioresque quam in prioribus, vix manifeste cinereo-argenteo strigatæ. Juxta angulum ani* lineolæ seu potius striolæ 3 tenuissimæ, contiguæ atræ (*marginis postici*). Posticæ albidæ *angustæ*, apice late fuscæ, *ciliis amplioribus quam in cæteris hujus generis. Cilia anticarum etiam ampla, cinerea nitidissima.*

Habitat cum præcedentibus (Strobilana).

Imago Apr. ?.

The words "marginis postici," which, as they stand, seem untranslatable, probably induced Dr. Wocke in his Catalogue to consider Haworth's insect a *Dichrorampha !*

I may remark that *pygmæana* appears, *at present*, to be by no means an abundant species. During the last half of April I have been able to secure only three specimens myself, and the total number taken does not exceed a dozen. Ratzeburg states that during cold and rainy weather the moth will not fly, but drops down to the ground, if disturbed. The almost total absence of fine and sunshiny days may, therefore, easily account for its scarcity. On the other hand, it may be that the majority of the brood were over before the first examples were discovered, and that those subsequently taken were only stragglers. On the continent, March and April are given as the time for *pygmæana* ; April and May for *abiegana*.

Merton Cottage, Cambridge :
May 4th, 1887.

[As Haworth described his *subsequana* in 1812, and Fischer's *abiegnana* (accurately described by Zeller in the Stettin. Entomolog. Zeitung, 1849, p. 245) was first described by Duponchel in his Fourth Supplementary volume, p. 409, under the name of *abiegana* in 1842, Haworth's name has priority by 30 years, and should be retained for this species.

It is rather singular, considering how few *Tortrices* occur in the early months of the year, that two somewhat similar species, both with white, or nearly white, hind-wings, should occur in March and April. —H. T. STAINTON.]

Halonota obscurana, Stph. (1834) *versus ravulana, H.-S.* (1849).—While lately looking over the figures of the *Tortrices* in Wood's "Index Entomologicus," that of *obscurana*, Stph., attracted my attention, as being wonderfully like *ravulana,* H.-S. I have since had an opportunity of seeing, in the collection of the British Museum, Stephens' own type of his *obscurana*, probably, and almost certainly the identical specimen which Wood depicted. It is a very perfect and well-marked example, of what we have been accustomed to call *ravulana*, H.-S. This name must, therefore, now sink, as Stephens' *obscurana* has the priority by fifteen years.—ID.: *May 9th,* 1887.

Ephestia ficulella, Barrett, = *desuetella, Walker.*—In the British Museum Catalogue (Suppl., p. 1719) Walker has described, under the name of *Nephopteryx desuetella,* an *Ephestia* from Australia which is certainly identical with *E. ficulella,* Barrett. I have found the species (as well as *E. elutella*) common enough and widely distributed in Australia. Of course Walker's description is unrecognisable, but I propose to adopt his name, because if I do not some other wiseacre will, and we may as well get over the difficulty at once. Perhaps there will be no harm in allowing British entomologists to have an occasional taste of that perennial fount of synonymy which springs from the British Museum Catalogues.—E. Meyrick, Ramsbury: *May* 10*th*, 1887.

Description of the larva of Ephestia ficella.—On May 21st last (1886) I received several larvæ of this species from Mr. W. G. Pearce, of London. Length about three-eighths of an inch; head small, a little narrower than the second segment, and is, along with the frontal and small anal plate, polished; body obese and cylindrical, but flattened a little ventrally, it tapers very slightly posteriorly, but more strongly towards the head; skin glossy and smooth, though the segmental divisions and slight transverse depressions on the segments give to it a rather puckered appearance. Ground-colour greyish-white, strongly tinged with pink; head brown; mandibles and frontal plate darker sienna-brown; the pulsating dorsal vessel shews through the skin as a dorsal stripe of a darker grey than the ground-colour; there are no perceptible sub-dorsal or spiracular stripes; tubercles brown and conspicuous. Ventral surface, legs and prolegs yellowish-white. Feeds on dried figs, raisins, currants, &c. I bred two moths only, the first on July 22nd, the other not appearing until September 6th.—Geo. T. Porritt, Huddersfield: *May* 11*th*, 1887.

Thecla quercûs with an orange spot on each fore-wing.—On the 1st of August, 1874, in the County of Norfolk, I sat for an hour or more in the top of an oak tree for the purpose of taking *Thecla quercûs*. Of five which I then netted one female has near the centre of each fore-wing (upper surface) an orange spot about the twelfth of an inch long. This spot is of a wedge shape with angles rounded off. It lies between the centre of the wing and the costa, and its small end points towards the tip of the wing. I possess a second specimen of this species of the same sex with a similar but much less distinct spot, probably caught at the same time, but I did not notice its faint spot in time to be sure of its date and locality. These specimens remind me of *Thecla betulæ* and of *Thecla w-album*, though in *betulæ* the spot is much larger, and in *w-album* it is smaller than in my *quercûs*.—Frank Norgate, Downham, Brandon, Suffolk: *April* 22*nd*, 1887.

[The above appears to refer to the var. *bellus*, Gerhard, which has been recorded from Hungary and probably Switzerland.—Eds.].

The larva of Notodonta torva.—I have been in the habit of rearing *Notodonta torva* for the last four or five years, and I can testify to the accuracy of Mr. Barrett's description of the larva. It is a dull edition of *N. ziczac*, exactly resembling it in form, but the colour being that of a soiled white kid glove shaded with a dark leaden tinge. It is hardy, feeds well on poplar generally, and is easily reared, having, in common with most of the *Notodontæ*, sometimes one, sometimes two broods in the year. Mr. Buckler's figures of *N. ziczac* are taken from rather dingy larvæ, often the colouring being very vivid, and the orange hue of the tail portion really lovely in its tint. It is impossible, however, to speak too highly of the figures of the *Notodontidæ* in this second volume. I am familiar with every one except *Notodonta cucullina*, and there are only two larvæ which I cannot entirely realize, as if the very caterpillar was before me—these are the very beautiful form of *N. camelina*, drawn in plate 35, fig. 3*a*, and the brown stick-like *N. dictæa*, plate 35, fig. 1. This latter much resembles drawings taken by me from the full grown larva of *N. argentina*. It is a great pleasure to have so fine a species as *N. torva* added to our lists, and entomologists must diligently search the aspen trees and bushes in hopes of further confirmation of the matter; the larva might be quite easily passed over as only *ziczac*.—R. C. R. JORDAN, 105, Harborne Road, Edgbaston: *May 6th*, 1887.

The occasional occurrence of Cossus ligniperda at "sugar."—It is probably familiar to most collectors of *Lepidoptera* that the Goat Moth is sometimes found on "sugared" trees. Such an experience happened to me five or six times when I used to collect moths. So far as my memory serves the individuals at "sugar" were invariably ♀. There can, I think, be no doubt they were *attracted* thereby, whatever may have been their ulterior motives. I shall be greatly obliged to any working Lepidopterist who can state with certainty that he has taken a ♂ Goat Moth on "sugar." Information on this point will tend to establish or crush a theory I have long held as to the reasons for the occurrence.

The question is of some importance from the point of view of an Economic Entomologist. Most entomologists know that the larvæ of the Goat Moth may often occur in all stages of growth in a particular tree, whereas, from no apparent reason, a neighbouring tree of the same species may be quite free from them. I incline to the opinion that a certain tree may, without being absolutely unhealthy, be in a condition favourable to the requirements of the Goat Moth. Any comparatively hard-wood tree attacked by its larvæ usually "bleeds," and this bleeding can scarcely go on without attracting attention on the part of other female Goat Moths in a condition for oviposition. Therefore, it seems to me probable that the Moth is not attracted *directly* by the "sugar," but mistakes it for the "bleeding" caused by larvæ of its own species. This theory would account for the visits of a practically tongueless Moth, as is *Cossus ligniperda*, to "sugared" trees. But if the ♂ also occurs, the suggestion is of little value.—R. MCLACHLAN, Lewisham, London: *February 1st*, 1887.

Eupithecia innotata—an enigma solved.—At page 136, vol. xxi, of this Magazine, I gave some account of a "pug" larva from *Artemisia vulgaris*, which Mr. Buckler and I could not identify. Mr. W. Warren, of Cambridge, now writes to tell me that, after reading my description of it, he has no doubt it was the larva of *Eupithecia innotata*. At page 257 of vol. xxii, Mr. Warren records the capture of four larvæ on *Artemisia maritima*; and in vol. xxiii, page 115, is the record of his exhibiting at the September meeting of the Entomological Society two specimens of the moth bred from these larvæ; they had proved to be *Eupithecia innotata*, so, more lucky than myself, he has been able to identify his captures.

I suppose Mr. Buckler did not think of *innotata* for this reason; he had figured a continental example of the larva for Mr. Crewe, in 1862, but certainly the variety submitted to his pencil was not much like that which I found; however, Mr. Warren tells me all his four larvæ varied from one another in appearance, so that *innotata* must be a species of which it is not sufficient to see a single larva.

Probably others may have taken this species in the larva state. Mr. Buckler remembered having received an example from Dr. Knaggs many years ago, but Mr. Warren has now enabled us to add, for certain, *Eupithecia innotata* to the British list; it may be as well, perhaps, to add that the moth can scarcely be separated from *fraxinata*, although the two larvæ are distinct enough.—J. Hellins, The Close, Exeter; *March* 1st, 1887.

Odour observable in males of Pieris napi.—I read with interest the notes on the odour emitted by *Hepialus hectus*, and on looking through some back volumes of the Magazine, I find a note by my father (Ent. Mo. Mag., vol. xix, p. 236), in which he says that I discovered *Pieris rapæ* to be scented. I was not aware of this note, or would have corrected an error therein. About twelve years ago I was staying at Nash, near Pembroke, and one day caught a male *Pieris napi* in my fingers, and at once discovered a strong scent about it, very like sweet scented verbena. Since then I have, every year, been accustomed to catch this butterfly for the sake of the scent, but I never found a *P. rapæ* that had any, though I have tried many, nor is there any in the female *P. napi* that I am aware of. The scent is very similar to that emitted by many species of *Nomada*, *Prosopis*, *Psithyrus (Apathus*, N.), among bees, and in all three cases it may be for the same purpose as in *H. hectus*.—R. C. L. Perkins, Sopworth Rectory, Chippenham: *March* 1*st*, 1887.

The flight and pairing of Hepialus humuli.—I was very pleased with the interesting observations upon this subject recorded in the December number of the Magazine by Dr. Chapman, because they afforded an explanation of a circumstance I had witnessed during the previous summer, and which I had been quite at a loss to comprehend: whilst passing a waste place by a road side, where several "ghosts" were indulging in their usual evening dances, a male dashed past me in a straight line—a flight so unusual that it attracted my attention. It stopped about six or eight yards from me, and about a foot from the ground, where there were a few twigs. I thought a spider's web had arrested its progress, as there was a slight flutter, a fall of about an inch, and one or two vibrations, as if swinging in a web. I could hardly imagine that a web would be strong enough to stop so strong a flight, and I went up to it to investigate. I then found that the moth was pendulous *in cop.* with a female which was sitting upon a twig. This made the matter seem still more surprising to me, as the ♂ had darted to the twig at a distance so great that it could not have seen the ♀ sitting upon it, and had gone past other ♂ s which were hovering a few yards off, and apparently unconscious of the proximity of the ♀. The whole circumstance seems incapable of any explanation, except that which Dr. Chapman supplies—that the ♀ had selected the ♂, and then flown to the twig, followed by it in hot haste.

There is one other peculiarity about the flight of this species, which I have not seen recorded, viz.: that when a ♂ is hovering over a particular spot if driven away it will invariably return to the same place. The first occasion on which I noticed this was one evening when mothing round a large mound. Each time I came to one particular spot there was a ♂ *H. humuli* hovering: as it had been driven out of its place to allow of my passing, I wondered whether it was the same or a different moth each time, so having driven it away again I watched it, and saw that it was the same which returned. I repeated the experiment, with the same result, so that that moth must have returned five or six times that evening to its hovering place. I have also not the least doubt that, although the ♂ of this species has but small antennæ, it is by scent that they return to the selected spot, because they always return against the wind, and if, as sometimes happens, they get a little on one side and pass the spot, they will fly back in a circuit which will cross the line of scent, and directly they come to it, will follow it up to the spot. I have never made search, but I have always imagined that the hovering Romeo had found Juliet escaping from the tomb, and was waiting while her bridal attire was being prepared.—A. Balding, Wisbech: *March* 16*th*, 1887.

Description and Habits of the Larvæ of Hedya lariciana and Pædisca occultana.—From about the middle of May to the beginning of June the larvæ of these two insects may be found feeding upon the larch in a somewhat similar manner, yet with so much difference in the method of eating that the species may be known before the larva is seen; indeed, so soon as the eye rests upon a larch-tassel tenanted by a larva, or upon which a larva has been feeding. Both species draw together the "needles" of the larch, thus forming a little cylinder in which the larva rests and is partially concealed whilst feeding. These little cylinders of needles vary in circumference according to the size of the larva, and are easily detected so soon as the larva has grown sufficiently to require four or five needles to form the staves of its little barrel residence. The central needles of a tassel are always selected, probably because they are more tender, and are more nearly parallel than the outer ones. When drawn together, and before the larva has begun to eat it, the tube may be detected by its being rather smaller at the top, owing to the needles being less, and, therefore, not forming so large a cylinder. Thus far both species proceed alike, but in feeding each proceeds differently. *Lariciana* selects one of the needles, and beginning at the top eats it as far down as it can contract within the tube. A second and a third needle are eaten down in a similar manner, the length of tube uneaten at the base indicating the size of the larva. When the top of the tube is thus partially eaten away so as not to afford concealment, the larva selects a fresh tassel and forms a fresh tube. The eaten and vacated tubes have a ragged appearance, especially when the larva is nearly full fed and requires seven or eight needles, of which more than half are eaten, generally alternate ones. When full fed, the larva pupates head upwards in the lower entire portion of its last tube, a slight web being made to protect the pupa, and through which the moth emerges. The larva of *occultana* begins eating at the top of its tube, and eats round and round, keeping the ends of all the needles level. In this manner it reduces its tube until there is nothing left but a small cup. It then forms another home, generally taking the next tassel. In this way each larva will leave four or five little cups, each a little longer than the last, and mostly in a row on the branch, so that if one of the empty cups is seen it is easy to trace the others along the branch until the larva is discovered in the last tenanted one, unless a fatality has happened to it, or it has done feeding. Pupation probably takes place in the ground, as when reared in a glass a loose coccoon is formed under the *débris*. Both species are very easily reared. The tassels with larvæ can be broken off and put in a glass jar, with a piece of rag tied over the top, and kept in a cool place out of the sun. Each three or four days a few fresh tassels of larch must be sprinkled in the jar until the larvæ are full fed. In about three weeks the moths emerge, that is, about the end of June or beginning of July.

The larva of *lariciana* is brownish flesh-colour, with the head dark brown, as is also the plate on the second segment and the front feet. The spots are scarcely if any darker, and only visible by being rather rough, as distinguished from the slightly shining surface of the skin. Anal plate broader than long, and darkest at its upper edge.

Occultana is a much larger larva than *lariciana,* the central segments being also stouter. In colour it is dark greyish-green, lighter between the segments, with conspicuous black shining spots. Head black; plate on second segment shining black, lighter towards the head. Dorsal line only visible on the second segment as a very fine light line. Anal plate large, black, round, inclining to oval. Spiracles black, distinct, edged with light, with one spot above and two below. Two sub-dorsal spots on each side, the anterior one being the highest. Eleventh segment with a spot beside (before) the spiracle, instead of above it. Twelfth segment with a very large dorsal spot, and only one sub-dorsal spot. Front feet black. Posterior legs with two small spots at base. Larva when young light green, with the spots distinct.

For the last eight or ten years I have found the larvæ of *lariciana* fairly plentiful on one small clump of larch trees whenever I have looked for them, so that I have no doubt, when "in season," I can send some to any of my correspondents who may require them. *Occultana* must be more variable in its appearance, as I did not detect it until last year, when it was even more plentiful than *lariciana,* or at any rate more easy to find, as *lariciana* after vacating one tassel will generally wander a distance before making another tube. Beside these two larvæ there is also another which may occasionally be found on the larch, *Batodes angustiorana,* but it has not had a proper apprenticeship to feeding upon larch, and instead of the neat method of the two species described, it makes a tangle in drawing the needles together, which gets worse as they grow. Except for this it might almost be mistaken for *lariciana.*—Id.: *February 5th,* 1887.

Notes on the life-history of Coleophora flavaginella, Lienig.—This species, which belongs to the obscure section of the genus *Coleophora,* of which *C. laripennella,* Zett. (*annulatella,* Tengström), is the best known member, was found by the Rev. C. R. Digby and Mr. Bankes on the coast of Dorsetshire, and on those of Kent and Sussex by myself in 1884. It seems to appear both as imago and larva earlier in the year than any of its near allies. The moth is on the wing throughout June and the first part of July; even in the backward season, 1886, I took a specimen on June 5th. The browner and narrower-winged species which feeds on *Atriplex portulacoides,* and has been identified as the insect known to Mühlig as *C. flavaginella,* flies towards the end of June and during July, and is, in turn, followed by *C. laripennella* and by *salinella* the whipper-in of the group.

The larva of the *C. flavaginella* of *Lienig* feeds during July and August on *Suæda maritima,* at first on the leaves, and afterwards on the flowers and fruits. It may be described thus:—length rather over $\frac{1}{6}$-in.; head light brown with darker markings; body pale yellow, darker posteriorly; corselet brown with pale median line; 3rd segment with four brown spots in the dorsal region; 2nd, 3rd and 4th with a lateral spot; a black medio-dorsal spot on the 12th segment; anal flap black, preceded by a black transverse line on the 13th segment. The ventral surface has a small black spot between 2nd and 3rd segments, and one between each of the segments from the 4th to the 11th. These spots are not noticed in my note book, and might be invisible in the living larvæ, but are very evident in preserved specimens.

The silken case measures $\frac{3}{8}$-in. × $\frac{3}{32}$-in., and is distinctly larger than those of the other species alluded to above. It is of a pale yellow or dirty white colour, with from three to five yellow or brown longitudinal stripes of variable width, a dark stripe sometimes running down a paler one. These stripes are more or less conspicuous in the cases of many *Coleophoræ*, and may be seen in those of the species mentioned above, and also in those of *C. apicella*, *C. artemisiella*, &c. I take them to be extra breadths of silk woven in to make the old gown fit its quickly growing wearer. They are, however, more distinct in the case of the *C. flavaginella* of *Lienig* than in those of its nearest allies, owing to its case being clean and not covered like theirs with sand or other foreign substances. The mouth is bent round so that the case is carried nearly flat, and the anal end is 3-lobed.—W. H. B. Fletcher, Fairlawn House, Worthing: *May 4th*, 1887.

Coleophora Mühligiella, n. sp. (formerly known as flavaginella of Mühlig).—Nearly 30 years ago (for it was in February, 1859), I received from Herr G. G. Mühlig, of Frankfort-on-the-Maine, bred specimens of a *Coleophora* (nearly allied to *annulatella*) under the name of *flavaginella*.

It was in the very same year, 1859, but in July, that I received from Dr. Nylander specimens of *flavaginella*, labelled "*Lienig*," which had come to him from Dr. af Tengström, who I suppose had received them direct from Madame Lienig herself, as representatives of the *flavaginella* described by Zeller in the Isis of 1846, from Madame Lienig's specimens. These specimens do not appear, however, to be identical with the *flavaginella* received from Herr Mühlig, and hence for some years we have been speaking of the *flavaginella* of *Lienig*, and the *flavaginella* of *Mühlig*.

It is time this trinomial confusion should cease. Mr. W. H. B. Fletcher, who has been breeding rather freely from *Suæda maritima*, an insect which I take to be the true *flavaginella* of *Lienig*, has furnished us with the life-history of that species. For the insect I had received from Herr Mühlig I would now propose the name of *Coleophora Mühligiella*.

Mühligiella is a narrower-winged, browner insect, with a straight costa barely edged with whitish beyond the middle, and with numerous scattered dark scales along the veins; its short case (very like that of *annulatella*) is of a nearly uniform grey-brown tint, frequently well covered with grains of sand.

Flavaginella is a broader-winged, greyer insect, with the costa more curved, more or less distinctly white edged from before the middle, sometimes almost from the base, and rarely with the slightest trace of any scattered dark scales along the veins; the case of this species has been well described by Mr. Fletcher above.

Herr Anton Schmid, in his Ratisbon *Lepidoptera* (Die Lepidopteren-Fauna der Regensburger Umgegend), ii, 117, gives, as the habitat of his *flavaginella*, which is doubtless identical with Mühlig's species (as the two Entomologists worked together at Frankfort for so very many years) :—

"Imago in July and August.

"Case in September and October on the seeds of *Chenopodium album*, *bonus*

Henricus, &c.; during hibernation often concealed beneath the bark of trees, yet again moving about in spring."—H. T. STAINTON, Mountsfield, Lewisham: *May 16th*, 1887.

On the life-history of Coleophora adjunctella, Hodgkinson (Ent. Mo. Mag., xviii, 189).—In June, 1886, I had the pleasure of breeding, and also of taking freely in some of the salt-marshes of Hampshire and Sussex, the above-named species. The moth may be obtained throughout the month. It flies from 6 to 7.30 p.m. among *Juncus Gerardi*, on the seeds of which the larva feeds. It appears on the wing a trifle earlier in the season than *C. cæspititiella*, from which it may be distinguished even as it flies by its smaller size and darker colour, while in the net the darkness of its head-parts is very noticeable. The larva feeds during August and September. Its case is nearly ¼-in. in length, and is formed of the perianth and capsule of the rush, with the addition of a silken mouth, and triquetrous 3-lobed tail-piece. The silken parts are at first white, but some become of the same colour as the capsule. Its greater size and the silken tail-piece distinguish it from the case of *C. obtusella*, which terminates posteriorly with the remains of the style of the rush-flower. The following description of the larva was taken on September 12th, 1885:—

About $\frac{3}{16}$-in. long; head light red, marked with brown round the mouth; body very pale whitish-yellow, pulsating vessel showing as a narrow dorsal line; 2nd segment with pale plate, divided by fine median line; on each side of the line about the middle of the plate a short transverse crescentic line of small dots; the plate shaded with brown along the line and on its hind margin; on the third segment on the dorsal surface are four small pale plates, with a dark brown spot in the centre of each; there are similar plates on the sides of the third and fourth segments; horny parts of legs dark brown; plates on flap and on sides of anal claspers also dark brown.—W. H. B. FLETCHER, Fairlawn House, Worthing: *March 17th*, 1887.

[This is the same species which I afterwards named *paludicola* (Ent. Mo. Mag., xxii, 9) from specimens taken by Mr. Coverdale in a salt-marsh at Shoeburyness. The narrow anterior wings and the generally quite dark antennæ (only sometimes partly pale-ringed on the under-side) seem to furnish the most striking characters. In 1876 Mr. Barrett sent me some specimens of a *Coleophora* from a salt-marsh, near Pembroke, which, though closely resembling this insect, have the anterior wings broader and rather yellower, and the antennæ more distinctly annulated, yet it would be difficult to say these specimens are a distinct species.—H. T. STAINTON: *April 4th*, 1887.]

Earinus nitidulus, Nees.—Mr. E. A. Atmore took a ♀ of this rare Braconid at King's Lynn the beginning of May. The Rev. T. A. Marshall says in his Monograph of the British *Braconidæ* (Tr. Ent. Soc., 1885, 269), that the only authority for its occurrence in England is Curtis' Guide, 2nd. ed., column 116. The specimen which Mr. Atmore took is the var. *thoracicus*, Nees.—JOHN B. BRIDGMAN, 40, St. Giles Street, Norwich: *May*, 1887.

Sitones and their time of feeding.—It is commonly stated that these weevils feed entirely by day, concealing themselves beneath clods, &c., or descending into the ground during the night. This is not the case, as any one can testify who has examined a few rows of seedling peas or beans at night by the light of a bull's-eye lantern.

The weevils may then be seen closely congregated around the edges of the leaves, and busily engaged in feeding; whereas, during the daytime, as far as regards my own experience, they feed in a very fitful and irregular manner, spending most of their time in basking in the sun, or wandering aimlessly about their food-plants, and a large number pass the hours of daylight in concealment. This may be proved by the simple experiment of firmly treading a small area of ground in the infested spots, and then watching carefully for results, which will speedily manifest themselves in the appearance of a number of the buried weevils, whose alarm is aroused by the unceremonious treatment to which they have been subjected. After dark, however, I have not found this experiment to answer, and believe that *all* the weevils ascend to the surface shortly after dusk.—Theodore Wood, St. Peter's, Kent: *March*, 1887.

Pelophila borealis: abnormal tarsi.—Some months ago Mr. Fowler called attention to a malformation of the left posterior tarsus in two specimens of *Pelophila borealis* received by him from the Rev. W. F. Johnson, of Armagh (*cf.* Ent. Mo. Mag., xxii, 138). Among a long series just to hand from the same gentleman I find a still more singular instance of deformity, the specimen in question having not only the posterior tarsus, but all three tarsi upon the *right* side greatly malformed.

The anterior tarsus apparently consists of only three joints, the two basal ones being slightly swollen, but not nearly to the same degree as those belonging to the corresponding limb (the specimen, like Mr. Fowler's, is a male). Of the two missing joints I can find no trace whatever, but the terminal joint is of normal size, and bears fully developed claws. In the intermediate tarsus four joints are present, all of a very much abbreviated character. The claws, however, are of the ordinary dimensions. The posterior tarsus is unfortunately broken, but of the three very small joints which remain, the second is strongly transverse and the third almost cordate. These three together scarcely exceed in length the first joint alone of the corresponding foot. The terminal spines of the tibia are also much abbreviated.

In some fifty specimens now before me I can find nothing at all similar, the only deformity of any kind being a slight contraction of one of the joints in the posterior tarsus of a male specimen.—Id.: *May 7th*, 1887.

Adephaga in the Armagh district.—In addition to those already communicated by me to the Rev. W. W. Fowler as occurring here, I have taken the following:—*Leistus fulvibarbis*, scarce; *Nebria Gyllenhali*, scarce; *Elaphrus riparius*, very common; *Badister bipustulatus*, *Harpalus rufibarbis*, and *H. latus*, common; *Pterostichus versicolor*, scarce; *P. strenuus*, *P. diligens*, and *P. vernalis*, all plentiful; *Amara ovata*, *A. curta*, and *A. trivialis*; *Pristonychus terricola*, several in an outhouse; *Anchomenus marginatus*, very plentiful on edges of loughs; *A. viduus*, *A. micans*, rare; *A. gracilis*, doubtful, as I have not a type; *Bembidium tibiale*, one specimen; *B. affine*, rare; *B. bruxellense* and *B. flammulatum*, tolerably plentiful; *B. fumigatum* and *B. Clarkii*, rare; *Trechus minutus* and var. *obtusus*, both plentiful; *Dromius linearis*, *D. meridionalis*, and *D. melanocephalus*, tolerably common, the specimens of the last which I have taken appear to belong to Stephens' var. *scutellaris*; *Haliplus fulvus*, not plentiful; *Noterus sparsus*, scarce; *Laccophilus obscurus*, *Cœlambus versicolor*, Schall. (*reticulatus*, F.), *C. novemlineatus*, and *Deronectes assimilis*, all plentiful at Lowry's Lough; *Hydroporus lepidus*, *H. nigrita*, *H.*

ferrugineus, and *H. morio*, Dej. (*atriceps*, Crotch), all rather scarce; *H. lineatus*, very common; *H. lituratus*, F. (*xanthopus*, Steph.), has not occurred here, and was placed erroneously by me in the Armagh list; *Agabus paludosus*, local; *A. chalconotus*, rare; *Ilybius ater*, *Rhantus notatus* and *Dytiscus punctulatus*, all scarce; *Acilius sulcatus* and *A. fasciatus*, De G. (*canaliculatus*, Nic.), local; *Gyrinus natator*, very common, and *G. bicolor*, scarce.

Last week I took for the first time *Blethisa multipunctata* on the shore of Lowry's Lough, in company with *Pelophila borealis*. I only succeeded in getting four specimens, but hope later on to procure more. Of *Dyschirius thoracicus* I took one specimen in some wet meadows near the town. Though I searched the same locality several times, I could not procure another.

To these I may add *Platyderus ruficollis*, *Amara ovata*, *A. tibialis*, and *Calathus micropterus*, all of which I took at Portballintrae, Co. Antrim.—W. F. Johnson, Winder Terrace, Armagh: *May* 11*th*, 1887.

Review.

British Pyralides, including the Pterophoridæ: by John Henry Leech, B.A., F.L.S., F.Z.S. 8vo, 121 pp., with 18 coloured plates. London: R. H. Porter. 1886.

This work has been compiled with a good intention. The author finds that "the *Pyralidæ* and their allies have been somewhat neglected in this country;" he therefore proposes to remedy this, but has overlooked the paramount necessity on his own part for an intimate knowledge of his subject.

Under the designation "*Pyralides*" he includes the genera which form the family *Deltoides* of Latreille and other authors, and also *Aventia*, which by some is considered to form a distinct family. The nomenclature followed is that of Staudinger and Wocke's Catalogue, but the arrangement of the species appears to be original. No characters of groups or genera are given, and, as a rule, no descriptions of species. The text consists mainly of localities taken from local lists without alphabetical or geographical arrangement, and of quotations from this and other magazines, and from Dr. Hofmann's "Kleinschmetterlingsraupen" (most of which are duly acknowledged). As a rule these quotations refer to the habits or descriptions of larvæ, and Pastor Mussehl's extraordinary account of the habits of the larva of *Calamotropha paludella* is copied as if an original observation. The account itself seems so improbable that it would be very interesting to know whether our author has really verified it. He has made the acquaintance of some of our rarest species on the shores of the Mediterranean, in the Canaries and elsewhere, and his observations upon them are of interest, but the work is greatly marred by indiscriminate quotation. Thus, although Mr. Hellins succeeded in rearing a specimen of *Hypenodes costæstrigalis* on *Thymus serpyllum*, it is obvious from the habits of the species that this cannot be its usual food-plant, and when the same observer reared *Stenia punctalis* on *Lotus*, plantain, &c., it should be borne in mind that the dead leaves were preferred by the larvæ, as are those of hornbeam by the larvæ of *Agrotera nemoralis*. Moreover, the quoted statements that *Crambus alpinellus* is found in fir woods, that *Mimæseoptilus bipunctidactylus* feeds on *Galium mollugo* and *M. pterodactylus (fuscus)* on *Convolvulus*, and that *Homæosoma nimbella* occurs among *Aster* and thistles, do not refer to these species as known in this country. The statement that *Ephestia semirufa* is found in grocers' warehouses refers to the semi-rufous form of *E. elutella*; the species now called *semirufa* has been taken only among old ivy; the *figure* (pl. ii, fig. 7) is that of the unicolorous variety of *Homœosoma sinuella* ♀. There is doubtless some ground for the assertion that the larva of *Dioryctria abietella* lives in fir cones in October, and spins a cocoon on the ground for the winter pupating in the spring, for Hofmann's statement is confirmed by M. Ragonot, yet we know that, with us, the larva feeds *in the spring*, in and below the young shoots of fir, with the *Retiniæ*.

The inclusion of two purely Continental species in this work by mistake for British (*Nephopteryx rhenella*, Zk., for *hostilis*, Steph., and *Melissoblaptes anellus*, Sch., for *bipunctanus*, Curt.) is, doubtless, accounted for by its advanced state when M. Ragonot's "Revision of the British species of *Phycitidæ* and *Galleridæ*" (Ent. Mo. Mag., vol. xxii, p. 17) appeared, and this will explain other similar matters, but the statement on page 50 that the female of *Acentropus* is "semi-apterous" is perplexing. Undoubtedly semi-apterous and even apterous examples have been found, but, supposing there is only one species, they may have been ill-developed. The female has usually much larger wings than the male, well formed and developed, and the figure of *A. niveus* on plate 6 is, to all appearance, that of a female. It is also difficult to account for the statement on page 75 that the males of *Crambus pratellus* are *paler* than the females.

As the author does not supply descriptions of the species but relies on coloured figures for their identification, a careful scrutiny of the plates is necessary. Many of the figures are excellent, and, in the majority of cases, recognisable; but a very large proportion of them are drawn from female specimens, and in the cases of *Hypena crassalis* (called here *Bomolocha fontis*), *Aphomia sociella* and *Chilo cicatricellus*, in which the (very different) males are not figured, the student has, from this work, no means of identifying them. In the last named species the figure is not recognisable, even as a female, from an error in the shape of the fore-wings. In *Cataclysta lemnata* and *Scoparia alpina* the sexes are transposed, *Ebulea verbascalis* is represented with *three* transverse lines, and in several of the *Crambidæ* and *Phycitidæ* identification is rendered difficult by slight errors in their markings. The figure of *Epischnia Farrella* does not represent that species, but the variety of *Anerastia lotella* with white costal margin; and the figure called *Myelois cirrigerella* on plate 10 bears no resemblance to *cirrigerella* in structure, shape, colour, or markings, but is a very good figure of *Cledeobia brunnealis*, a native of central and southern Europe.

We are sorry to have to find fault so persistently with a beginner's first production; but works of this class are mischievous, not only from their repetition and perpetuation of errors, but also from the fact that, being attractive, they seriously interfere with the demand for those of greater accuracy and more real value.

ENTOMOLOGICAL SOCIETY OF LONDON: *May 4th*, 1887.—Dr. DAVID SHARP, F.Z.S., President, in the Chair.

The Rev. C. Ellis-Stevens, B.D., of Brooklyn, New York, U.S.A.; Mr. Frederic Merrifield, of 24, Vernon Terrace, Brighton; Mr. Henry Rowland Brown, B.A., of Oxhey Grove, Stanmore; and Mr. Coryndon Matthews, of Ivybridge, Devon, were elected Fellows.

Mr. Wm. Warren exhibited specimens of *Stigmonota pallifrontana*, *S. internana*, *Asthenia pygmæana*, Hüb., and *A. abiegana*, Dup. (*subsequana*, Haw.). Mr. Stainton remarked that the two last named species both had white under-wings, and were, in other respects, very similar. It was formerly thought that Haworth's *subsequana* was identical with the species previously figured by Hübner as *pygmæana*; but now that the two allied species were critically examined it appeared that the species described by Haworth as *subsequana* was not Hübner's *pygmæana*, but another species known as the *abiegana* of Duponchel, dating only from 1842, so that Haworth's name of *subsequana* had priority by thirty years.

Mr. F. Pascoe exhibited a specimen of *Diaxines Taylori*, Wath., taken out of the stem of an orchid—*Saccolabium cæleste*—growing in an orchid-house at Croydon, and received from Moulmein, in Burmah.

Mr. McLachlan exhibited nearly 200 specimens of *Neuroptera*, in beautiful condition, collected by Mr. E. Meyrick in various parts of Australia and Tasmania, comprising about seventy species. There were between forty and fifty species of *Trichoptera*, including moth-like forms from Western Australia, allied to *Plectrotarsus*, Kol.; and other species belonging to a group represented by *Hydropsyche Edwardsii*, McLach. Among the *Planipennia* the most remarkable insect was a new species of the singular genus *Psychopsis*, Newm., from Mount Kosciusko, where it was common. Of *Pseudo-Neuroptera* there was a species of *Embiidæ* from Western Australia, and certain curious *Psocidæ* and *Perlidæ*. The *Trichoptera* appeared to be exclusively confined to *Sericostomatidæ*, *Leptoceridæ*, and *Hydropsychidæ*. Mr. Meyrick made some remarks on the localities in which he had collected the species.

Mr. M. Jacoby exhibited a new species of *Xenarthra*, collected by Mr. G. Lewis in Ceylon; also a species of *Loxoprosopus* from Brazil.

Mr. C. O. Waterhouse exhibited a living example of an *Ichneumon*—*Ophion macrurum*—bred from a larva of *Callosamia promethea*, a North American species of *Saturnidæ*. He also exhibited a number of wings of *Lepidoptera* denuded of the scales and explained the method he had adopted for removing the scales. The wings were first dipped in spirit and then placed in eau de javelle (potassium hyperchlorite). Mr. Waterhouse said he had sometimes substituted peroxide of hydrogen for eau de javelle, but the action was much less rapid, although the results were satisfactory. Mr. Poulton observed that, although the pigment had disappeared, he thought the scales were not removed, but were merely rendered transparent; and he remarked that the discovery of some chemical for softening chitine had long been wanted to prepare specimens for the microscope. The discussion was continued by Mr. McLachlan and Dr. Sharp.

Mr. Slater read a note, extracted from the "Medical Press," on the subject of the poison used by certain tribes of African Bushmen in the preparation of their arrows. It was stated that a poison was prepared by them from the entrails of a caterpillar which they called "N'gwa."

The Rev. W. W. Fowler read a note received from Mr. J. Gardner, of Hartlepool, in which it was stated that *Dytiscus marginalis* possessed the power of making a loud buzzing noise like that of a humble bee. Dr. Sharp said he was familiar with the humming of *Dytiscus marginalis* previous to flight, and thought it might perhaps be connected with an inflation of the body for the purpose of diminishing the specific gravity of the insect; he had noticed also that it was occasionally accompanied by the discharge of fluid from the body. Mr. Wm. White read a paper "On the occurrence of anomalous spots on Lepidopterous larvæ." A discussion ensued, in which Mr. Poulton and others took part. Mr. Waterhouse read "Descriptions of new genera and species of *Buprestidæ*."—H. Goss, *Hon. Secretary*.

Obituary.

Rev. John Hellins, M.A.—We deeply regret to announce the death of the Rev. John Hellins, which took place in the early morning of Monday, May 9th, from an attack of erysipelas of the throat, which only commenced the previous Saturday. Mr. Hellins had nearly completed his 58th year, having been born on the 15th May, 1829; he was thus considerably younger than his friend William Buckler, whom he survived little more than three years.

John Hellins will always be best known from his long connection with William Buckler in the task of describing Lepidopterous larvæ, and since the latter's death he ably assisted the Ray Society by writing many additional descriptions, which have appeared in the two volumes of Buckler's "Larvæ of British Butterflies and Moths" already published.

Mr. Hellins entered at All Saints' College, Oxford, where he took his B.A. degree in 1851. In 1852 he was ordained Deacon, and Priest in 1854. He was for some time Second Master at the Exeter Grammar School, but, in 1859, he became Chaplain to the Devon County Prison, in succession to his father. Some six or seven years ago he was threatened with blindness from cataract, and had to retire from this position, and his health seemed thoroughly broken. Prolonged absence from work, and rest amid strange scenes in Switzerland and elsewhere, had a recuperative effect, and he returned to Exeter with improved health and one useful eye, and was again able to undertake some clerical duties, and resume his entomological occupations. He must have commenced the pursuit of Entomology early in life, but we are not able to supply the precise date. His entomological diaries are continuous from 1857 to 1887 (the last entry being made on the Saturday he was taken ill), and the diary of 1857 is evidently not the work of one then just commencing the study. He was a very successful rearer of larvæ from the egg, and a close and patient observer; a constant and ready correspondent, and a faithful friend; so that he will be much missed by a large circle.

A list of his descriptions of larvæ appeared in our Vol. xx, pp. 232, 233, when we were noticing his labours in connection with those of his friend, W. Buckler. The work on which Mr. Hellins was specially engaged at the time of his death was the description of the larvæ that will be figured in the forthcoming Vol. iii of Buckler's book, of which figures but no descriptions had been left by Mr. Buckler. In this task Mr. Hellins had enlisted the aid of numerous friends, who, after the long chilly spring, were hoping, with warmer weather, to be able to assist him with more frequent samples of larvæ. At the earnest solicitation of the Ray Society, Mr. W. H. B. Fletcher, of Fairlawn House, Worthing, Sussex, has kindly undertaken to take up the broken thread of Mr. Hellins' work, and the Ray Society will feel much obliged to those who had hoped to forward larvæ to Mr. Hellins in the ensuing season, if they will now be so good as to make Mr. Fletcher the recipient of their contributions.

Mr. Hellins leaves a widow and a son and daughter to deplore the loss of an affectionate husband and father. This is not the place to enlarge upon his private virtues. He occasionally made his entomological friends his confidants in private matters, and there are those among us who can testify to the noble and self-sacrificing character of the man in connection with his endeavours to assist discharged prisoners who had been under his care.

NOTE ON SOME BRITISH *COCCIDÆ* (No. 7).

BY J. W. DOUGLAS, F.E.S.

ISCHNASPIS, *n. g.*

♀ scale very long and narrow, sides parallel, larval exuviæ with a fringed margin, followed by two moults, of which the latter is very long: pygidium without spinerets in groups, but having a design of irregular lattice-work, composed apparently of thickening of, or under, the integument, in that pattern.

♂ scale not half the length of the ♀, of like form, but only one moult beyond the larval exuviæ: imago not known.

ISCHNASPIS FILIFORMIS, *n. sp.*

Fig. 1.

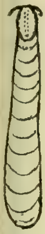


Fig. 3.

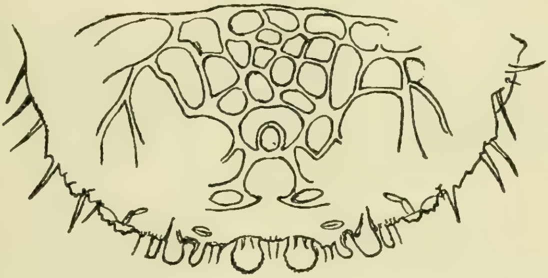
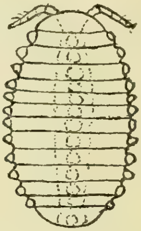


Fig. 2.



♀ scale jet-black, shining, straight, filiform (Fig. 1); larval exuviæ oval, small, ochreous, with a concolorous, small, flat, angularly-lobate marginal fringe (detached, Fig. 2); the third pellicle at least twice the length of the second, widely rounded at the extremity, the successive minute increments of development perceptible throughout the scale: pygidium occupied with a lattice-work formation of irregular pattern, similar but not quite identical in all examples, yet on the posterior portion always alike; a few isolated spinnerets near the margin: posterior margin with two median, distant, large, posteriorly rounded lobes, then on each side one smaller curved outwardly, and then another larger, but not so large as the median, with a small one adjoining; some small spines between the lobes and five or six large ones beyond, the margin there having dentate plates (Fig. 3).

Length, 3—3·5, breadth, 0·40 mm.

♂ scale narrower and not half the length.

The figures are from photo-transfers of camera-drawings by Mr. G. S. Saunders.

Altogether one of the most remarkable forms of *Diaspina* that I know, both in respect of the scale and the character of the pygidium.

Abundant in the conservatories of the Royal Botanic Society on the leaves of various palms, *Strychnos*, *Myristica*, and other plants, looking like little bits of silk thread accidentally affixed.

MYTILASPIS PINNÆFORMIS.

Aspidiotus pinnæformis, Bouché, Stett. ent. Zeit., xii, 111, 5 (1851).

Mytilaspis pinnæformis, Sign., Ess. Cochin., p. 141, pl. vi, figs. 4 and 8.

♀. Scale elongate, straight or curved, mussel-shaped, flat-convex transversely, yellowish-brown, the margin distinctly white, the larval exuviæ about one-fourth of the entire length, concolorous or darker, also with a white margin, the next pellicle very long. Bouché says (*l. c.*) "Similar to *A. pomorum*, but smaller, flatter, smoother, and with a broader, paler margin;" to which may be added the colour is much lighter. Length, 3 mm.

♀ adult long, flat, yellow; the sides posteriorly serrate; the last segment with five groups of spinnerets—anterior 4, anterior lateral 5, inferior lateral 4, each, between them and near the posterior margin many isolated spinnerets; the margin has two trifoliate median lobes, followed on each side with two much smaller, and six or seven spines.

♂ scale not half the length of the ♀, straight.

♂ imago small, yellowish-white, the transverse band of the metathorax dark, antennæ and legs pubescent, abdomen short (Signoret).

On a leaf of the orchid *Cymbidium pendulum*, received from the Royal Gardens at Kew, was a numerous colony of the scales in all stages of existence. Bouché states that his examples were on *Cymbidium aloifolium*; Signoret says on "les *Cymbidium*;" the species probably lives on various orchids.

POLIASPIS CYCADIS.

Poliaspis cycadis, Comstock, Report for 1883, p. 126, fig. 15.

♀ scale snowy-white, larval exuviæ yellowish; greatly widened posteriorly as in ♀ *Chionaspis*. Size in the adult state varies considerably; the average may be stated as, length 3, breadth 1·75 mm.

♀ adult greenish-yellow, oval; the five ordinary groups of spinnerets containing, anterior 2—4, anterior lateral 8—13, posterior lateral 18—25 each, the three superior groups each with 2—4 spinnerets; median lobes of the margin prominent, outwardly serrate, 2nd lobe deeply incised: plates slender and cylindrical, one at the side of 1st and 2nd lobes, and four or five on the lateral margin of the three or four preceding segments: two spines between the median lobes, and a few others on the margin.

♂ scale snow-white, small, narrow, parallel-sided; exuviæ at one end; surface slightly convex transversely, no carinæ. Length, 1 mm.

I have not seen a ♂ imago. It is described as "bright orange-red, with thoracic band of same colour; eyes black; first five segments of antennæ purplish-red, the other five yellow" (Comstock).

Maskell (Trans. N. Z. Inst., xii, 293, 1879) instituted the genus *Poliaspis*, an offset of *Mytilaspis*, and characterized it as "having the spinnerets in more than five groups, and in a double row, the edge of the abdomen as in *Diaspis*. Signoret forms a genus *Leucaspis* which possesses the same characters, but it has also a fringe of spiny hairs set close together round the edge of the abdomen, which fringe is absent in *Poliaspis*."

Comstock (*l. c.*) says of *Poliaspis*—"I am far from feeling sure that the genus will prove to be a natural one." The same may really be said of many other so-called genera; the term "genus" being an abstract ideality to express certain forms or conditions of variation; but while such a group or individual, by its or their segregation, may sometimes serve the purpose of classification, science is always encumbered with the names.

In the month of February I received from the Royal Gardens at Kew some pieces of the bark of *Cycas revoluta* with some of these scales attached, all more or less covered by and involved in the fine short brown fibre which is natural to the plant, and which frequently interferes with the development in regular form of the ♀ scale.

DIASPIS ROSÆ.

Aspidiotus rosæ, Bouché, Naturgesch. d. schädl. und nützl. Garten-Insecten, p. 53, 2 (1833); *id.*, Naturgesch. der Insecten; p. 14, 2, pl. i, fig. 6 (1834); Burm., Handb., ii, 68, 2 (1835).

Diaspis rosæ, Sign., Ess. Cochin., p. 123, pl. v, fig. 3 & 3*a*; Maskell, Trans. N. Z. Inst., xi, p. 201, pl. vi, fig. 9 (1878); Comstock, Report for 1880, p. 312, pl. v, fig. 1, 1*a*, & 1*b*; pl. xvii, fig. 1; pl. xxi, fig. 5; Goethe, Jahrb. d. nassau. Ver. f. Naturk., 1884, p. 116, T. 1, fig. 7, 8, 10.

♀ scale rounded-oval, nearly circular, white, the yellowish larval exuviæ towards one side. Diam., 2—3 mm.

♀ adult elongate, anteriorly broad, red, posteriorly yellow, segments distinct, each with spinose plates at the sides, on the last are five groups of spinnerets nearly or quite connected, especially the laterals, anterior with 20, anterior and posterior laterals with 25—30 each, besides some isolated spinnerets; margin with two oblique median lobes, narrowly separated at base, two others on each side deeply incised, thence, up to the preceding segment, five or six spines.

♂ scale very small, narrow, tricarinate. Length, 1 mm.

♂ imago orange-red, wings white, antennæ and legs yellowish, slightly pubescent.

As the author of the original name of this species, *Aspidiotus rosæ*, Signoret (Ess. Cochin., p. 67) gives Sandberg (1784), and in this he has been followed by other writers, but both the generic and specific names were first given by Bouché (*l. c.*), Sandberg having referred to the insect only as the "Schildläuse des Rosensträuches."* His article on its natural history, considering the time at which it was written, is full and precise, and has some graphic touches, as, for instance, where he says the insect being one of the smallest (requiring a magnifying glass in order to observe it), yet the ♀ has, in proportion, an enormous scale (ungeheuer Schild). The history ends moralizing, thus: "This is the biography of a creature whose world consists of two inches of a little branch of a rose-bush, and it accomplishes what most men do: werden, vermehren sich und—sterben."

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* Naturgeschichte der Schildläuse des Rosensträuches; von K. v. Sandberg: in Abhandlungen eines Privatgesells. Boehmen, vi, 317 (1784).

The species is not rare on the continent of Europe, and all authors state that it is found on cultivated roses. Bouché says that it lives on the stems and old shoots, which at times are quite covered with the scales, making them appear as if mouldy, and that if not removed (the best way of doing so being by means of a hard brush) the bush is killed by them. Signoret makes a similar remark. Comstock says the species is very common on roses, both in the Southern and Northern States of North America, and that he also finds the scales on raspberries and blackberries (*Rubus*). Maskell finds it on garden-roses in New Zealand. Walker includes the species in his list of British *Coccidæ*, and I have often sought for the scales, both on garden and wild roses, but in vain. On March 1st Mr. Parfitt sent from Exeter some old ♀ scales which he had just found on the stems of a wild rose (*Rosa canina*), and on bramble stems, growing in a hedge, and these were assuredly the ♀ of *Diaspis rosæ*; and on the 5th following he found some of the ♂ scales. He thus writes: "Since my first visit I find the hedge has been cut down to within a foot of the ground. However, I secured a branch of the rose and was pleased to find a few male scales. I could find no scales on the young branches, only on the old stems. This appears to be a scarce species, as I have walked past miles of hedges within the last two years, but have seen these scales in two places only, and the one just mentioned is likely to be destroyed."

PULVINARIA MESEMBRYANTHEMI.

——— *mesembrianthemi*, Vallot, Bull. de Férussac ii, p. 469 (1830).
Calypticus mesembrianthemi, Costa, Ann. d. Acad. Asp. Nat. Naples, 273 (1844).
Pulvinaria biplicata, Targ.-Tozz., Catal., p. 34 (1868).
Pulvinaria mesembrianthemi, Sign., Ess. Cochin., 215.

The synonymy comes from Signoret, *l. c.* The genus adopted by Vallot is not given, and I cannot refer to the original. *P. biplicata*, Targ.-Tozz., cited by Signoret as a synonym, was not described; it was only denominated "n. sp. (*Mesembrianthemi acinaciformis* incola)."

♀ scale, adult. Ovate, yellowish-brown, slightly convex, with three or four strong corrugations across the middle, often, however, in the most advanced condition, the dry scale is also contorted or bent backwards. Underneath, and projecting posteriorly, is a large, long, white ovisac, smooth above, but otherwise composed of loose, tangled, cottony filaments, among which are the yellow eggs and larvæ. Antennæ of eight joints, the 3rd longest. Length of scale 4—5, breadth 3—3·5 mm.

In the young stages and up to the time of the formation of the ovisac, the entire insect is delicate pale green and the scale is smooth; the colour becomes gradually brown, and the transverse folds then also first appear, developing as the scale becomes dry.

On a small piece of a *Mesembryanthemum* imported from Spain, received from Dr. W. H. Lowe, Wimbledon, in April, was a numerous colony of this species in all stages of existence.

LECANIUM TESSELLATUM.

Lecanium tessellatum, Sign., Ess. Cochin., p. 231, pl. 11, fig. 4.

♀. Scale flat-convex, short broad-oval, much widened posteriorly, a little narrowed anteriorly, one side usually straighter than the other, or somewhat curved inwardly, and sometimes with one or two slight incisions; pale greenish-yellow, covered with dark-lined irregular reticulation or tesselation, each mesh containing numerous dark dots more or less in rows, the middle of the disc occupied by a long, wide, irregular sided space. This is the immature form and is the *L. tessellatum* of Signoret. In a still younger state the scale, although of full size, is flat, without marking, colourless and transparent. The mature form, more convex than in the immature, foveate-punctate; along the middle of the back a broad, flattened, black ridge, from which, on either side, the black colour extends downwards all round, more or less suffusing two or three rows of meshes, and often forming a well-defined blotch, but leaving a space of two rows of clear reticulation between it and the margin; within the bounds of the blotch four or five transverse furrows, the broad intervening spaces flat, each having at its lower end a pale spot; anal point above the cleft yellow. Under-side, body anteriorly white, posteriorly black; legs and antennæ pale, the latter of seven joints, the 3rd twice as long as the 4th, 6th and 7th still longer. Length, 3·5, breadth, 3 mm.

Young larvæ under the mature scales. No ♂ scales seen.

At p. 77, vol. xxiii, I have mentioned this species, then known to me only by Signoret's description and figure, in comparison with *L. alienum*, and I can now confirm the differences there stated.

Received from Mr. Sowerby, Royal Botanic Society's Gardens, on *Sapindus saponaria*, and from Mr. J. O'Brien, Harrow, on the same plant, in all stages of existence on a leaf.

LECANIUM ANGUSTATUM.

Lecanium angustatum, Sign., Ess. Cochin., p. 228, pl. 11, fig. 2.

♀. Scale clear yellow, elongate, narrow, flat (sometimes with a tendency to a median blunt carina), smooth, shining, sides nearly straight and not recurved, both ends rounded. Under-side all pale; antennæ of seven joints, 3rd and 4th longest; tibiæ canaliculate, the tarsi, when viewed obliquely, appear flattened and broader than the tibiæ. Eggs and larvæ within the body.

Length, 4·5—5, breadth, 2 mm.

Except as to the slight indication of a median keel this agrees exactly with Signoret's description of *L. angustatum*, which was found on *Papyrus*. My specimens came from leaves of *Anthurium Scherzerianum*, a native of Costa Rica, received from the Royal Botanic Society's Gardens, Regent's Park, in January and February last.

THE MALE OF LECANIUM HESPERIDUM.

In the "Comptes rendus des Séances de l'Académie des Sciences" (Paris), No. 7, Feb. 14, 1887, p. 449, is an article entitled "Les mâles du *Lecanium hesperidum* et la parthénogénèse," by M. R. Moniez. The author premises that sexual dimorphism is ordinarily present in the *Coccidæ*, the males, contrary to the females, being winged and undergoing complete metamorphoses, yet that in many species they are hitherto unknown, although the females are continually reproductive. Among the species having this character *Lecanium hesperidum* is always cited, and Leydig and Leuckart are specially mentioned among those who have in vain sought for the males. Then he continues :—

> "But this species is by no means parthenogenetic; at least, I have found males in abundance in nearly all the numerous females from different localities that I have examined. I have always found each one isolated in an ovarian *cul-de-sac*, those containing males appearing to be mixed with those containing larvæ of the females."

The author then states that he observed several stages of development. In the first there are no external organs, the body appearing to be entirely occupied by the "follicules testiculaires," as yet not differentiated, the integument very thin. The second stage is distinguished by having five or six folds of the enveloping membrane, which doubtless correspond to the segments; the evolution of the spermatozoids is effected, the testicles are clearly distinguished, compressed by the development of the rudiments of the organs. At the third stage, which represents the perfect insect, all the salient organs which characterize the adult are present. But the young male has no trace of eyes, and its skin remains very tender, strongly contrasting with the chitinous integument and the well-developed eyes of the young females, which are found at the same time in the body of the mother.

The summary of these observations is thus given :—

> "The male of *Lecanium hesperidum*, among all those hitherto known, is therefore characterized by its minute size, the form of the penis, the absence of eyes and wings, the character of the integument, and the development of the spermatozoids before the appearance of members, at a stage which doubtless corresponds to that of pupa."

Then follows a statement of the progressive development of the organs, leading to the conclusion that—

> "The organization of the male does not permit a doubt that there is pairing, but I have not been able to decide if it takes place within or without the body of the mother. I could not find a male outside of the mother, not even under her body, but its imperfect condition rather induces me to suppose that the females are fecundated within the maternal organization.
>
> "If, however, we consider that the spermatozoids are mature in *Lecanium hesperidum* at the time when the males are yet without relative organization, we

cannot but think that there is here a transitory state, or even a still lower degree of development, which may be definite in some species of the same family or any other group. We may even conceive that the males may be rudimentary in such a manner that they may be reduced, in the body of the mother, to sexual elements, and thus there may be produced there a kind of false hermaphroditism; they might even be represented in the lowest degree by undifferentiated elements, but which, nevertheless, come into connection with the ovules; it may thus happen that the so-called *pseudova* may be identical, in their evolution, with ordinary eggs, and, as in the known hypothesis in connection with agamic *Aphides*, that the development of the ovules was determined by the hermaphroditism of the females. Be this as it may, as the males escape observation in every case, one cannot fail to infer that parthenogenesis or pedogenesis, which is a form of it, exists. In fine, we conceive that these reduced males may be able, in certain seasons and under certain influences, in consequence of a more retarded evolution of the genital products, to acquire a perfect development and exhibit normal characteristics.

"It appears possible to apply these considerations, until there is proof to the contrary, to the various parthenogenetic animals, with the exception, perhaps, of certain *Hymenoptera* among which the phenomena are more complicated. Parthenogenesis constitutes a peculiar fact which hitherto has not received sufficient explanation, and it may be, that like many other facts apparently aberrant, it will one day come under the general law of sexual reproduction."

The discovery of the male of *Lecanium hesperidum*, although the mode of action or influence of this sex has yet to be elucidated, is of itself of very great interest, and in the inferences and suggestions arising from it, with respect to the recondite subject of parthenogenesis in general, has a significance and importance not exceeded by any revelation of modern science.

LECANIUM DEPRESSUM.

Lecanium depressum, Sign., Ess. Cochin., p. 269, pl. 12, fig. 11, 11*a*, and 11*b*.

♀. Scale convex more or less according to age. Form broad-oval or ovate, sometimes one side nearly straight, or incurved so much that the outline is subreniform or subpyriform. Colour pale greenish-yellow; a black or dark median line, not carinate; the disc with black dotted lines disposed so as to form marquetry, in the mature form these coalesce and make patches, but leaving the ground colour clear in places, usually two anterior and two posterior; lower down straight dotted lines radiate to the margin all round; on the anterior half on each side two distinct dark-dotted carinæ with pale ends extend to the margin, the posterior ones nearly at a right angle, the anterior oblique, all of them corresponding to the legs beneath. Under a high power the surface is seen to be covered with a reticulation of irregular, shallow cells, and the black dots are resolved into spots with a pale centre or ocellus, each spot, situate in a mesh, appears as an inlaid plate of tesselation. Anal point yellow. Under-side all pale, except the abdomen, which is black. Antennæ of eight joints, the 3rd longest. Length, 4, breadth, 3·5 mm.

This description differs from that of Signoret in that he gives the colour of the scale as brown, which does not occur, in my experience.

until the insect is nearly or quite dead, and then the markings have disappeared. He also states that scales he received from Florence (which I take to have been the typical form) were oval, a little elongated anteriorly, and having two depressions in the region of the lateral carinæ (as appears in his figure 11): this form I do not find. At first I was inclined to describe my examples as a new species, under the name of *L. simulans*, but as the other characters given are present, and in view also of the variation admitted by Signoret, I have concluded that there are scarcely sufficient grounds to establish a distinct species. Yet it may be that if one had all the forms before him contemporaneously, two or three good species might be determined.

Signoret attributes the name *depressum* to Targioni-Tozzetti ("Studii sulle Cocciniglie," p. 29, and "Catalog," p. 37), and doubtless correctly, but as in neither place is the species described, the reference cannot be cited: Signoret really first described the species.

I had the scales, in April and May, from Mr. S. Stevens, on leaves of *Ficus elastica* and camellias, and from other sources on leaves of camellias. Signoret obtained his examples from Florence on leaves of *Ficus marticinensis*, and in Paris on *Ficus elastica*. Maskell finds the scales in greenhouses (the plants not mentioned) in New Zealand, stating it is an imported species. (Trans. N. Z. Inst., xi, 206, 1878).

LECANIUM FILICUM.

Chermes filicum, Boisd., Ent. Hort., p. 336.

Lecanium filicum, Sign., Ess. Cochin., p. 266, pl. xii, fig. 8.

♀. Scale short, broad-oval, very convex, smooth, with two anterior and two posterior slight blunt carinæ going rather obliquely from the back to the margin, thus interrupting the curve of the contour, and sometimes two or three short and sharp vertical carinæ at the sides joining the margin, which is broad and flat. Antennæ of eight joints, the 3rd the longest. The articulation of the tarsi with the tibiæ is very distinct, as Signoret observes. When alive the colour is reddish-brown, becoming paler or yellowish after death.

I have long known this species from various cultivated ferns, but could not determine it with certainty; for while Signoret (*l. c.*) says "celle-ci offre des carènes dorsales," his figure shows the carinæ to be obliquely transverse across the sides. However, having received some scales from Dr. Signoret, I can now identify the species. It is like *L. hemisphæricum* in having a flattened margin, but is distinguished from it in having carinæ, and, as a rule, it is smaller. It is also related to *L. hibernaculorum*, which is larger, darker, and without margin.

8, Beaufort Gardens, Lewisham:
May, 1887.

ON THE *MYCALESIS ASOCHIS* OF HEWITSON, A BUTTERFLY OF THE SUB-FAMILY *SATYRINÆ*.

BY ARTHUR G. BUTLER, F.L.S., F.Z.S., &c.

In the third volume of his Exotic Butterflies, *Mycalesis*, Pl. vii, figs. 46, 47, Hewitson figures a curious species from Old Calabar. His description is so incorrect ("the basal half of both wings white") that unless figured, this butterfly could only have been recognised by a reference to the type ; as a matter of fact the wings are bone-whitish, the primaries having a broad costal border, and nearly the external half dark brown, but the secondaries only a broad border, occupying about one-fifth of the wing.

In the Hewitson cabinet, associated with his types of *M. Asochis* are two female examples of an allied but apparently perfectly distinct species, supposed by Hewitson to be females of *M. Asochis ;* the true female, however, as proved by a specimen in the Museum collection, does not differ from the male to anything like the extent of these specimens.

The species regarded by Hewitson as *M. Asochis*, ♀, was briefly described by Mr. Kirby in a Catalogue of the *Lepidoptera* in the Museum of Science and Art, Dublin, in 1879, as probably the female of that species.

The male examples in the Hewitson cabinet are neither of them his type, as they do not agree accurately with his figure, and neither his males nor his females are labelled with locality-tickets ; the probability is that the type was a poor specimen, and was destroyed by its owner as soon as he acquired fresher examples. A male example in our collection from the Gaboon agrees with Hewitson's figures, and a second from Accra only differs in very slight details.

A female recently received from Old Calabar only differs from the male in its superior size, browner basal area, and rather narrower borders above, and in the defined brown stripes across the wings below. I have very little doubt, therefore, about the distinctness of Hewitson's females, but in the absence of any locality-labels I hesitate to give a name. It may readily be recognised by those who possess it, from the fact, that the narrow border of the primaries is twice excavated, forming what is known as a "key pattern," or a castellated border, whilst near the anal angle of the secondaries there is a more or less defined rounded black spot, representing the ocellus of the under surface ; the border, excepting at apex, is very narrow, scarcely represented by more than three closely approximated dark brown lines.

British Museum : *March*, 1887.

PSYCHOPSIS MEYRICKI, *n. sp.*

BY ROBERT McLACHLAN, F.R.S., &c.

P. Meyricki.

Allied to *P. insolens*, McLach. (Journal of Entomology, ii, p. 114, pl. vi, fig. 3), but smaller and darker. Head yellow, but the anterior swollen portion of the vertex is blackish-fuscous, which colour continues to below the base of the antennæ on the front; clothing yellow. Antennæ reddish-brown, dingy yellowish towards the base. Pronotum and entire breast yellow, with concolorous hairs. Meso- and meta-nota suffused with livid grey. Legs yellow; apex of tibiæ, and of the tarsal joints (faintly), marked with fuscescent. Abdomen above livid (or pale leaden) grey, beneath yellowish; hairs yellow: superior appendages (♂) in the form of two elongate yellow valves, flattened laterally, convergent at base and apex above, furnished with very long yellow hairs, sub-obtuse at apex, with an oval callus in the middle externally; the margin of the last ventral segment is regular, and internally, seen ventrally, appear to be two smaller flattened valves, convergent apically, probably representing the inferior appendages, the triangular space between them is blackish.

Anterior-wings whitish-hyaline, but densely tessellated or freckled with pale grey markings, vaguely arranged in transverse oblique lines; three or four subquadrate spots on the area between the sub-costa and the sector, and others on the inner margin, are darker and more conspicuous: neuration for the most part blackish-fuscous, but with numerous pale spaces; hairs of neuration mostly yellowish, but mixed with blackish, and on the margins the hairs alternate in pale and dark spaces (conspicuous on the costal margin): two series of gradate nervules, one placed before the middle of the wing, the other extending downwards from the point where the sub-costa and radius become confluent. Posterior-wings with indications of grey freckling and darker spots, but much less conspicuous; the characteristic large rounded spot at the confluence of sub-costa and radius is pale fuscous. Length of body, 9—10 mm. Expanse, 26—28 mm.

Hab.: Mount Kosciusko (New South Wales), 2800 ft., 20th January, 1885.

I have seven examples before me, apparently all ♂, collected by Mr. E. Meyrick, who says the insect was abundant on rocks, whither it went to avoid the sun and heat.

P. insolens, McLach., is larger and much paler; the anterior-wings have a tendency to be marked in the same manner, but with ochreous-yellow instead of grey, and in the posterior-wings there is only the large rounded ante-apical spot. Moreover, in *P. insolens*, and in all the other species, there is a third, sub-marginal, series of gradate nervules in the anterior-wings, continuous with the series of transverse nervules in the costal area; of this third series I see no trace in *P. Meyricki*.

I have said that all my examples of *P. Meyricki* appear to be ♂; so I judge from the comparatively slender abdomen. If this be so, then it is probable that the examples of all the other species in my collection are ♀. In these the abdomen is stouter, and the parts I have termed "superior appendages" are somewhat similar, but they are closely applied to large, triangular, obtuse, inferior lateral plates, of which I see no indications in the specimens of *Meyricki*. This is a point to be elucidated, as are also the early stages and habits of *Psychopsis*, which is a purely Australian genus, and one of the most curious amongst the *Planipennia*.

Five species of *Psychopsis* are now known, viz.:—*P. mimica*, Newm., *elegans*, Guérin, *cœlivaga*, Walker, *insolens*, McLach., and *Meyricki*, McLach.

Lewisham, London: *June*, 1887.

NOTHOLESTES ELWESI, A NEW GENUS AND SPECIES OF *CALOPTERYGINA*.

BY ROBERT McLACHLAN, F.R.S., &c.

NOTHOLESTES, *n. g.*

Resembling a large *Lestes* in form, stature, and coloration.

Wings rather narrow, hyaline, petiolated up to three-fourths (or four-fifths) of the basal area. Nodus at about the end of the first third of the wing. Basal area empty; quadrilateral traversed by a single nervule. Sectors of the arculus only slightly separated at their base, inserted rather below the middle of the arculus, which is not broken. Principal sector connected with the median for a long space. Ante-cubital nervules numerous. Sector inferior extending to beyond middle of wing. Post-costal area very narrow, not dilated at end, with a single row of cellules. Supplementary sectors between each of the chief nervures, all ending in a curved manner. Pterostigma oblong, slightly dilated.

Legs slender, moderate, ciliations very long. Abdomen long and slender, cylindrical; appendices (♂) forcipate.

It appears to me that in general characters this genus is more nearly allied to the Amazonian *Dicterias* than to others of the same group from India, but it can be immediately separated therefrom by the very long ciliation of the legs, and the far more numerous and curved supplementary sectors in the apical portion of the wings, &c. No doubt there is also relationship with the Indian *Bayadera*, but the very narrow post-costal area, with only a single row of cellules, at once separates it therefrom, notwithstanding that the legs and many points of neuration are similar. *Anisoneura* from the same country differs in the post-costal area, and in the principal sector not being contiguous to (or connected with) the median.

The Himalayan region seems particularly fertile in odd forms of *Calopterygina.*

NOTHOLESTES ELWESI, *n. sp.*

♂. Abdomen, 36 mm. Inferior-wing, 31 mm.

Wings narrow, but gradually dilated to the rounded apex, the inferior broader than the superior; hyaline, but slightly tinged throughout with olivaceous; 14—16 ante-cubital nervules, 23—25 post-cubital; pterostigma (2 mm.) brownish-black, surmounting 2½ cellules. Head, above, brassy-cupreous, black behind the eyes; rhinarium metallic-green; labrum metallic-cupreous, with a yellow spot on each side; second joint of antennæ yellow, the rest black; labium, &c., black. Thorax brilliant metallic-green, with a brassy tinge, the sutures blackish; sides (below the inter-alar pleuræ) and breast pale yellow, with an isolated bronzy streak on the metathoracic pleuræ; the space between the legs black.

Legs black, but the coxæ and trochanters are pale yellow, like the breast.

Abdomen bronzy-cupreous, becoming blackish after the 5th segment, and blackish beneath; 1st segment yellow at the sides and beneath; 9th segment above powdery-white (and there are indications that this white pulverulence may extend to the 8th); 10th segment nearly as long as the 9th, its margin regular, slightly rounded. Superior appendages scarcely longer than the 10th segment (owing to their form), black, forcipate, strongly geniculate in the middle; they are thinnest at the point of geniculation; the apical portion dilated, obtuse, sinuate and excised on the inner margin before the apex; externally are three sharp teeth on the basal half of the apical portion (beyond the geniculation). Inferior appendages black, shorter than the superior, flattened, nearly straight and sub-parallel; but the apices are thickened and inturned, and there is an internal tooth below the apex, so that the tips appear bifid internally with an excision between the two teeth.

♀ unknown.

Hab.: Darjiling; one ♂ given to me by H. J. Elwes, Esq., F.L.S., by whom it was captured.

In general form, metallic coloration of the body, the white-powdered 9th segment, and also in the appendages, this insect has so much resemblance to a somewhat large *Lestes*, that I had so considered it, until the neuration revealed its true position.

Lewisham, London: *June*, 1887.

NOTES ON *NOMADA*.

BY EDWARD SAUNDERS, F.L.S.

Mr. R. C. L. Perkins' remarks (vol. xxiii, p. 273) on those species of this genus which are inquiline on *Halictus* open a very interesting question. The females of *Halictus*, as he points out, hibernate, but this habit has not been observed in *Nomada*, and if it does not exist in that genus the question arises, how is the race of the inquiline continued?

It is, of course, not impossible that *Nomada*, like *Psithyrus*, may hibernate as an imago, although probably ere this some one would have found it in its winter quarters. If, however (as I believe is generally thought), the species of *Halictus* hibernate in the original burrows in which they reached maturity, there would seem to be no reason why the larvæ of *Nomada* should not remain in the full-fed state through the winter, passing through their final stages in the following spring, and emerging with the spring females of *Halictus*.

A careful examination of the burrows during the winter in colonies where the inquilines occur alone could prove this, and I hope Mr. Perkins himself will be able to make the necessary investigations.

Nomada is peculiar among the inquiline genera in one very striking particular, namely, the complete dissimilarity which it bears to the genera with which it associates. Nearly all the other genera resemble their hosts very closely in structure, and so remarkable in some cases is this resemblance, that it is thought by some, and certainly with a great deal of apparent probability, that the *inquilines* have only become structurally differentiated from their hosts by a gradual divergence of habit.

Nomada is known to associate with *Halictus*, *Andrena*, *Panurgus*, and *Eucera* in this country, but to none of these does it bear the slightest resemblance; in fact, its elegant shape, and the wasp-like colours of most of the species distinguish it at once from any other genus of the *Anthophila*. Professor Perez ably and carefully traces its structural relationship to *Megachile*, but on what principle it should have dissociated itself from its long-tongued allies, and associated itself with species of the short-tongued division is hard to see: possibly, its bright colours having made it an object of attack, it was unable to resist the stinging powers of the *Apidæ*, and was driven to the *Andrenidæ*, whose stinging powers are particularly feeble; but, if this be so, one has to seek for an explanation of the association of *Nomada* 6-*fasciata* and *Eucera*; or it is possible that the wasp-like colours of the species make them objects of terror, except to those genera of *Apidæ*, which know their own superior strength. The only other association which we have between long- and short-tongued genera is that between *Colletes* and *Epeolus*; and it is worthy of notice that the species of both these genera sting with peculiar virulence.

St. Ann's, Mason's Hill,
Bromley, Kent:
May 23*rd*, 1887.

NOTES ON BRITISH *TORTRICES.*

BY C. G. BARRETT, F.E.S.

(*Continued from Vol.* xxiii, *p.* 4).

Concerning the type-specimens of certain rare and reputed British species.

Through the friendly intervention of Dr. Mason, I have had an opportunity of examining the original types from which several of our rare, doubtful, and reputed British species of *Tortrices* were described.

Penthina Grevillana, Curt.—The two original specimens are in Mr. Edwin Shepherd's collection. They are not only known to be the specimens from which Curtis's figure and description were taken, but they agree accurately in markings with the figure to the most delicate dot or ripple, though it must be admitted that the *figure* is somewhat distorted, the right wing being too much arched and elongated.

After a very careful examination of these two specimens, I am thoroughly satisfied that they are pale specimens of *P. sauciana.* They agree with it in size, in shape, in the form and proportion of the dark and of the white divisions of the fore-wings, in every blacker blotch and streak in the dark portion, and in the delicate rippled lines and apical markings of the white portion, but they *look* different, because these markings are not obscured by the deep blackness which usually characterizes *sauciana. P. Grevillana* has long been a very doubtful species. I have never seen more than two specimens which appeared to me referable to it, *and they did not agree very well with each other*, nor quite satisfactorily with Curtis's figure. What species they really are may be a subject for future consideration; but I think that we should be perfectly safe in expunging from our lists a name which rests on so unsatisfactory a foundation.

Penthina ustulana, Haw.—The original type is also in Mr. E. Shepherd's collection, having upon its pin Haworth's label. It is in poor condition, and faded, but agrees fairly in shape and colour with *fuligana*, Haw., yet has the absence of marbling of brown in the fore-wings, and an indication of the yellowish dorsal blotch, which are usually characteristic of *nigricostana.* I think it impossible to decide which of these two species it belongs to, and am well satisfied that it has been dropped out of our lists.

(I think that *nigricostana* is out of place in the genus *Halonota*, and very closely allied to *Penthina fuligana* and *carbonana.*)

Retinia duplana, Hüb.—In Mr. Shepherd's collection are six of the original specimens on which this species was introduced into our lists. They are—like all the other British specimens which have come under my notice—small dark *turionella*. Moreover, the original description of *duplana* (as British) in the Ent. Ann., 1856, p. 34, proves that the specimens were not true *duplana*: "Like a small dark *turionella*, but the thorax grey only, the head and palpi ferruginous." But in *duplana*, as sent from Germany by Professor Zeller, the head and palpi are *grey*, and the markings and colouring quite different. The Scottish specimens are small, and the thorax is decidedly dark, agreeing with the darker wings, but no character seems to exist which is available to distinguish them from *turionella*. I think *duplana* should now be expunged from our lists.

Tortrix dissimilana, Bentley.—The original specimen is in the same collection, and was correctly referred to *piceana*, L. It is, however, rather a curious variety, having the markings edged here and there with faint black streaks. From the name which he gave it, Mr. Bentley would seem to have been acquainted with both sexes. No British specimen of the male is, however, known to be extant.

Stigmonota Heegerana, Dup. ?.—The original specimen (and probably the only known British example), labelled "taken at Whittlesea Mere in July," is in the same collection. It is rather faded, but is unmistakeably *corollana*, Hüb.,—thus confirming a correction already made.

In Mr. Shepherd's collection are also several of the original types, on the faith of which species were included in our fauna, which were afterwards expunged as aliens. They all appear in Stephens' Brit. Museum Catalogue, but only as reputed British species, and with the locality, "North America ?." These specimens are carefully labelled as follows: "*Peregrinana*."
"*Obliquana*, Bent."

These names appear in Stephens' Catalogue, page 90, and *obliquana* is figured very accurately by Mr. Humphreys (W. and H., v. ii, pl. 80, fig. 8). I believe this species to be *Pandemis albariana*, Walk., a native of North America. It agrees very well with the figure in Lord Walsingham's work on North American *Tortricidæ*, plate 62, fig. 10.

"*Trileucana*."—This is *Ptycholoma persicana*, Fitch (*blandana*, Clemens, *fragariana*, Packard), agreeing well with North American specimens sent me some years ago by Professor Fernald, of Maine State College. In Stephens' list, p. 90, *Crœsia trileucana*.

"*Biustulana*" (two specimens).—This is figured in Westwood and Humphreys' work (vol. ii, pl. 80, fig. 10); Stephens says of it that he has seen only two specimens, which he believes came from the West of England. He might well have said *farther* west. It is *Ptycholoma melaleucana*, Zeller, from Virginia, Maine, Pennsylvania, and Ohio. It is well figured by Lord Walsingham (pl. 62, fig. 8), and agrees with my types from Professor Fernald.

"*Flavofasciana*."—This moth is figured under the same name by Humphreys (W. and H., vol. ii, pl. 99, fig. 16), with the statement—"from Mr. Stone's collection, now in the cabinet of Mr. Bentley." From Mr. Bentley's cabinet it passed to Mr. E. Shepherd's. It is *Sericoris instrutana*, Clemens, from North America, and agrees with types from Prof. Fernald, sent as *Exartema fasciatana*.

King's Lynn, Norfolk:
March, 1887.

THE PROBABLE MIGRATION OF *APORIA CRATÆGI*.

BY J. W. TUTT, F.E.S.

I should like to say a few words with regard to the note of Mr. Goss, published in the Ent. Mo. Mag. (vol. xxiii, p. 220–221). Mr. Goss, in his first paragraph (on p. 257), shows that he does not exactly grasp the meaning I intended to convey, when he says, "By this I understand Mr. Tutt to mean that the same conditions of the climate of this country, which have been unfavourable to the development and increase of indigenous specimens of this species, and have tended towards its rarity or extinction, have also prevented its recruiting its numbers by migration, or rather immigration, from the Continent."

This sentence certainly does not exactly embody the view I hold on the subject. Facts prove that we have at various times had *Aporia cratægi* very abundant in England (sometimes for many successive years), and at other times it has been exceptionally scarce. Mr. Baker's letter (p. 256) shows one such case, my own letter (pp. 220, 221) gives another.

I believe that certain species of *Lepidoptera*, among them probably *A. cratægi*, are migratory in their habits, and that migration or immigration takes place at no fixed time or period, but is totally dependent on certain general* causes, atmospheric or otherwise, about which we are all (as far as I know) in the most perfect ignorance, and may take place in several successive seasons, or may not take place for many years. Certain undefined *local* causes have undoubtedly combined to make the species in question (*A. cratægi*) extinct in Britain at the present time. This seems to have previously occurred, and yet it became common again. What explains these periodic appearances so well as immigration? What I venture to suggest is this—that the insect will remain extinct in Britain until the general causes (whatever they may be) which induce migration in insects act in such a manner as to bring a wave of immigrants to our shores again. Whether the species will then establish itself for a time depends on local conditions.

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* I have used the word "general," because the causes which induce migration here are apparently at work in other parts of the world—America, Ceylon, &c.

Migration or immigration is, in my opinion, due to one set of causes (which we may well term general), and the establishment (permanent or otherwise) of the species is due entirely to other conditions (local), viz.:—those of the atmosphere, climate, distribution of food-plant, &c., of those localities which the immigrants take possession of.

Mr. Goss compares *Aporia cratægi* with the genus *Melitæa.* The larva of *A. cratægi* is gregarious, as are to a certain extent the species in the genus *Melitæa.* Here, to my mind, the similarity ends. He remarks that "*A. cratægi* is capable of soaring a great height when pursued or alarmed," and "is a powerful flyer." These facts separate it at once in its habits from the sluggish *Melitææ*, which sham death in the net, and, if alarmed, often fall to the ground. But even supposing this species to be generally sluggish, why should it not be migratory? We must remember that the swarms of insects are not acting under normal, but under very abnormal conditions. It is not, I presume, normal for any insect to travel thousands of miles out to sea, except at special times, and driven probably by a strong migratory instinct.

Mr. Goss also compares *A. cratægi* with *Colias Edusa*, *C. Hyale*, *Vanessa cardui*, *Sphinx convolvuli*, and other migratory and cosmopolitan species, and suggests that *A. cratægi* cannot be placed in the same category as these. Certainly not! but because *A. cratægi* is not cosmopolitan, is this a proof or a probable proof that it is not migratory? Is *Urania Leilus* cosmopolitan, or *Timetes Chiron?* Yet we have proof positive that these are migratory *within certain limits* (*vide* "The Naturalist in Nicaragua," by Thos. Belt, F.G.S., or the extracts of the late Mr. Newman, Ent., vol. vii, pp. 60 and 61). I believe *A. cratægi* extends over almost as wide an area in the Old World as these species in the New. *A. cratægi* is found more or less throughout Europe and Western Asia. I see no reason myself why the insect should not be migratory because it is not cosmopolitan. How many actual swarms of *C. Edusa* have been seen on the wing migrating? Have any? Yet there are few Entomologists who doubt that it does migrate; but where is the positive proof?

Mr. Goss also asks, "If *A. cratægi* is migratory in its habits, why do we not occasionally hear of its capture in Kent and other parts of the South-East of England in those seasons when a larger number than usual of such species as *Pieris Daplidice*, *Argynnis Lathonia*, and other immigrants from the Continent occur?" I do not believe the same causes produce migration in different species. The weight of evidence is contrary to the opinion that they do. How often have the swarms of *C. Edusa* and *Hyale* been coincident? How many *C. Hyale*, for instance, were taken in the *Edusa* year (1877)?; and has a migration of *P. brassicæ* always accompanied one of *Vanessa Antiopa?*

I do not see how the absence of *A. cratægi* in years when *P. Daplidice* and *A. Lathonia are reported* "to occur in larger numbers than usual" at all influences the question as to the migratory power or not of that species.

I quite agree with Mr. Goss that as it is an abundant species in many parts of the Continent of Europe, there *ought not* to be any difficulty in ascertaining from Continental Lepidopterists whether or not it is migratory in its habits. Unfortunately in those species which are acknowledged migrants, actual migration has rarely been noted. It is, indeed, marvellous that so few cases are scattered throughout our Entomological literature.

Rayleigh Villa, Westcombe Park, S.E.:
April, 1887.

HISTORICAL NOTES ON *APORIA CRATÆGI* IN ENGLAND.

BY C. W. DALE, F.E.S.

At the meeting of the South London Entomological Society, on January 27th, Mr. Jenner Weir stated that his opinion was that in the earlier decades of the century a flight of this insect visited Sussex from some part of the continent. Whether it be so or no, I will not venture to dispute, but by consulting the works of Merrett ("Pinax"), 1667, Ray, 1710, and Petiver, in 1717, we find that *Aporia cratægi* existed in England long before then.

Mr. Goss, in the March number of Ent. Mo. Mag., gives as his opinion that the extreme scarcity, or total disappearance of *A. cratægi* may be due to a succession of wet ungenial summers and mild winters.

Mr. Carrington, at the Meeting of the South London Entomological Society, attributed it to the severe winter of either 1878 or 1879. It must be borne in mind that the year 1829 had a remarkably wet sunless summer, followed by a most severe winter; and that the winter of 1813—1814 was so severe that an ox was roasted on the Thames.

I think it is far more probable that the extinction of *A. cratægi* is due to the great increase of small birds, the natural consequence of the destruction of so many birds of prey. Kollar states: "Small birds, particularly the titmice, devour the caterpillars soon after they are hatched, as well as in the following spring, when they are dispersed upon the shoots. So eager are the birds that they break into their nests late in the autumn to obtain them."

In addition to the eight counties mentioned by Mr. Goss in Ent. Mo. Mag., vol. xxiii, pp. 217—219, *Aporia cratægi* has occurred in Devonshire (see Ent. Mo. Mag., vol. xxiii, p. 256), Norfolk, Suffolk, Cambridgeshire, Berkshire (see Curtis' British Entomology: not occurred since 1831), Middlesex, Surrey, Somersetshire, Gloucestershire, and Worcestershire (1871). The last appears to have been taken at Festiniog, in North Wales, in 1883 (see Entomologist, vol. xv, p. 255).

Glanville's Wootton: *April*, 1887.

[We alluded to some of the old authors cited by Mr. Dale in a foot-note on p. 277, vol. xxiii, and Mr. Hellins (*l. c.*) mentioned the influence that the protection of small birds may have had. We are still quite of opinion that *A. cratægi* is not to be classed amongst migratory species; and with reference to Mr. Parfitt's suggestion (*l. c.*) that its appearance in Devonshire was due to immigration from the continent, we would ask (assuming the existence of immigration for the sake of argument), why not immigration from Hampshire or some other English county?—Eds.]

Aporia cratægi in Wyre Forest.—A few years ago this handsome butterfly used to occur not uncommonly in the above locality, but I know of no one who has seen or captured a specimen recently. I will endeavour this season to undertake a thorough exploration of the Forest, with a view to "turning it up." I may remark that Wyre Forest is in the Counties of Worcester and Shropshire. I have never heard of the "Black Veined White" being taken in Warwickshire, though there are a few recorded instances of its occurrence in the more northerly County of Staffordshire, but none of recent date. It really seems as if this butterfly had followed in the trail of *Lycæna semiargus*, *L. Corydon*, *Apatura Iris*, *Melanargia Galathea*, and many others, which were formerly taken in several localities in the Midlands.—W. Harcourt Bath, Ladywood, Birmingham : *June*, 1887.

[Our correspondent should define more clearly what he intends by "a few years ago."—Eds.]

The influence of small birds in assisting the extinction of Aporia cratægi.—In the last No. of the Magazine, the Rev. J. Hellins says that "the protection of 'small birds' must have some influence" in diminishing the chances of the survival of a large day-flying insect.

I have collected in Kent for at least thirty years, and it must be quite twenty-five years since I last saw *Aporia cratægi* flying in that county ; but, during the whole of the thirty years, I have never seen any bird but a sparrow attempt to catch a butterfly. In the second place, if it be argued that the larva would be devoured, I can only say that I never knew a small bird to eat a large caterpillar, if it could get one that could be more easily swallowed ; of our indigenous species the robin and the great tit certainly select green caterpillars in preference to others, and, when feeding their young, I have watched both these birds with their mouths full of the green pests of the gooseberry and currant ; from observation of cage birds I should say that the finches certainly show a similar preference, the green larvæ of *Mamestra* being chosen before the brown, though all are greedily devoured.

However, apart from these facts, my experience is that the "Wild Birds Protection Act" has not prevented the rapid decrease of many of the small birds in Kent ; the wholesale destruction of woods, combined with active building operations, are more than sufficient to render such an Act a mere farce, so far as finches and warblers are concerned. It is true that blackbirds, thrushes and skylarks, which might eat the larvæ of *A. cratægi*, have all increased of late years ; but the Act does not protect these birds.—Arthur G. Butler, 10, Avington Grove, Penge : *April 30th*, 1887.

Odour observable in males of Pieris napi.—I am able to confirm in the most positive manner the observation recorded by Mr. R. C. L. Perkins, *ante*, p. 11. I have been aware of the existence of this odour since 1829, and I published the following note on the subject in the "Mémoires de la Société Royale des Sciences de Liége," tome 2, 1844, in my "Enumération des Lépidoptères de la Belgique :"—"This is the place to remark that the ♂ of *Pieris napi* has a very strong aromatic odour, similar to that of thyme. I am surprised that no entomologist has noticed the existence of this odour, *which is constant*. I think that the ♂ of the var. *bryoniæ*, from the Simplon, has the same odour."

Now, in 1887, I am able to complete my old note of 1844, by saying that I have since taken in other parts of the Swiss Alps (where the ♀ *napi* type is always replaced by the var. ♀ *bryoniæ*) males giving out the same odour as the ordinary males of Belgium, &c. I likened this odour to that of thyme, but Mr. Perkins' comparison with that of verbena is more exact. It is to be desired that some biological chemist will study the cause of this odour, which exists always in the ♂ of *P. napi* and its varieties, but never in the ♀.

My note, translated above, was given when characterizing the variety *nigro-*

venosa, Selys (1844), which I have since recognised as identical with *sabellicæ*, Stephens (see Ann. Soc. Ent. France, 1859, Bulletin, p. xcii), so that Stephens' name has priority; this variety is intermediate between the typical form and the var. *bryoniæ*.—E. DE SELYS-LONGCHAMPS, Liége, Belgium: *June 6th*, 1887.

Abundance of the larvæ of Abraxas grossulariata.—Latterly I became aware that some gooseberry-bushes were becoming bare of leaves, and I suspected the larvæ of *Nematus ribesii* of having caused the damage, as on former occasions; but a slight inspection was enough to show they were not the culprits, the plea of *alibi* was admitted, and they were honourably acquitted. The real raiders stood confessed and unabashed in the form of the larvæ of *Abraxas grossulariata* in such numbers that some of the bushes had nothing left on them but leaf-stalks, the devourers had then mostly migrated to other gooseberry-bushes, which were being fast reduced to the same condition, and the hordes were advancing to devour the leaves of adjacent currant-bushes. This was too much for me, and, like a celebrated living statesman who, when he is angry and wishes to relieve his feelings, proceeds to "smash something," I determined to adopt his plan of action, and smash these marauders: so I beat the bush and killed with a spud all the multitude that fell; yet, after continued vigorous thrashing, the cry was, still they come. And, after all, there were some—fine, fat fellows—that must have been directors of the company, that were the last to leave the plunder, and now came swinging gently by a delicate cord, suggesting an evasion of their responsibilities and punishment by a suspense-account. But inexorable fate was against them: I acted Atropos, and cut their thread of life, without the shears. Yet I am sure some of the wretches escaped, for several days afterwards I saw some *in situ*, that from their fair, sleek appearance, were deserving of being deemed survivors of the fittest. Notwithstanding their soft, refined looks, they were hardened sinners, for where the earth on which they fell was soft, they bore a good blow without apparent injury. This episodial *échenillage* may serve as a fresh instance of the well-known facts, that a vast swarm of the larvæ of a species may be congregated in a small space and prosper there in spite of winter-like weather; and also that in the previous year the parent moths were very scarce in that restricted region.—J. W. DOUGLAS, 8, Beaufort Gardens, Lewisham: *June 3rd*, 1887.

P.S.—Since the foregoing was written I have discovered that I had been aided by unseen friends in my endeavours to get rid of the caterpillars, for I have just found about a dozen of the black-banded cocoons of the Hymenopterous parasite, *Casinaria vidua*, openly attached to the bare twigs of the currant and gooseberry bushes. Adjacent to them were the empty skins of the larvæ of *Abraxas*, out of which the parasitic larvæ had come, after serving their private ends and ruining their hosts. These sappers and miners have now left their cover and show themselves fearlessly in their true though not final colours, for they will change their uniform on promotion to their ultimate rank and condition.—*June 10th*, 1887.

Coleophora Mühligiella.—I notice in the June number of the Ent. Mo. Mag., p. 14, Mr. Stainton has described a *Coleophora* under this name. Unfortunately there is already a species of that genus which was named *Muehligella* by Wocke

(Heinemann, p. 604). It would thus be advisable to give another name to the new species.—E. L. Ragonot, Paris: *May 30th*, 1887.

[In compliance with Mr. Ragonot's kind suggestion, I would propose the name *Mœniacella*, derived from Francofurtum Mœniacum, where my friend Herr G. G. Mühlig lived and died—the insect will thus still be tributary to his memory.—H. T. Stainton.]

Acrolepia marcidella in Dorsetshire.—On the 23rd of June last year (1886) I captured on the South Dorset coast a specimen of that apparently little known species *Acrolepia marcidella*, for the identification of which I am indebted to the kindness of Messrs. C. G. Barrett and H. T. Stainton. I beat it out of an old thorn hedge where it had no doubt hibernated. The only plant which is at all unusual that I can recall as growing near is *Hyoscyamus niger*. If any of your numerous correspondents have met with this insect, perhaps they might recall some conjecture as to its food-plant made at the time of capture, and so assist in discovering the larva.—C. R. Digby, Studland Rectory, Wareham: *May 28th*, 1887.

Tinea picarella.—My friend, the late Mr. John Sang, succeeded in breeding *picarella* last year, though I was myself quite unsuccessful. I am pleased, however, to record that I have been successful this season in rearing a few specimens of this pretty little insect from fungus.—J. Gardner, 8, Friar Terrace, Hartlepool: *May 25th*, 1887.

Notes on Sesia conopiformis and Platyptilus Fischeri.—There are two species of *Lepidoptera* that it seems probable to me will occur with us if looked for in the right places. The first of these is *Sesia conopiformis*, Esp. In the Ent. Mo. Mag., January, 1871, there is published a list of insects caught by me at the Drachenfels—amongst these *tipuliformis* is mentioned; this occurring in an oak wood without currant bushes was always a mystery, but a better acquaintance with European *Sesiæ* enables me to decide that the specimen in question is *conopiformis*. To separate the two species is very difficult, but *conopiformis* is decidedly rather larger, and the colouring is brighter, the transparent fenestrum near the apex of the wing is broader, and there is a marked yellow spot at the lower extremity of the thorax between it and the abdomen. It feeds as a larva under the bark of the oak; any specimen referred to *tipuliformis* caught in the woods deserves careful examination. The second insect is *Platyptilus Fischeri*. This little plume, smaller than any of our native *Platyptili*, and very distinct from them, seems to me to occur wherever its food-plant (*Antennaria dioica*) is found. It was common as far north as Throndjem in Norway, and is not at all rare in the Alps. Now, as the pretty *Gnaphalium* referred to is found on our Scottish hills, it is probable that the moth would occur there also; at all events, it is worth a search.—R. C. R. Jordan, 105, Harborne Road, Edgbaston: *May*, 1887.

Variation in Scoparia ingratella; and remarks on S. ambigualis and S. atomalis.—Varieties of *Scoparia (Eudorea) ingratella*, somewhat resembling the varieties of *S. pyralella (dubitalis)*, mentioned by your correspondent, Mr. Eustace

R. Bankes (vol. xxiii, p. 258), occur in moderate numbers among typical *S. ingratella*, which is found commonly on the coast near Dover, Folkestone, and Deal, but the variation is more extended and general than it seems to be in the Purbeck locality. I have a dozen striking pale varieties of *ingratella* in my series, which I captured in July last (1886), the varieties showing almost every intermediate form between the type with white ground colour and distinct markings, and pure spotless white. I have only captured two of these latter forms, one in 1866, the other, July, 1885 (Entom., xix, p. 129); but I have one with the faintest possible trace of the chief markings, viz., the quadrate spot on the costa, and the transverse band across the base of the anterior-wings outlined in pale brown, the insect looking almost as white as the pure form; another has only a slight trace of the quadrate spot, the basal band being represented by a dot on the costa, and a very short longitudinal line where the centre of the band ought to be. These are the only markings. In others, the whole of the markings are faintly outlined, leading gradually up to the type. Even in this original home of *ingratella* some of the typical form are inseparable from inland *dubitalis* taken in Kent and Surrey, and from others I have which were taken in the neighbourhood of Darlington. The capture by Mr. Bankes of similar varieties of *pyralella* is interesting, and serves to show how artificial is the separation of these two so-called species. There is one thing, however, I should like to see explained relative to them: typical *dubitalis* occur in large numbers in Kent and Surrey from May 28th to June 21st, but the coast species (?), *ingratella*, is never on the wing until June 28th, or thereabouts, and continues well into July. I have paid great attention to the times of appearance of these two forms, but always with the same result. Can any one explain this?

Whilst writing about this matter, I may mention another fact that has just been brought prominently under my notice concerning two other doubtful species in this genus—*atomalis* and *ambigualis*. A short time ago, I received a pair of Shetland *atomalis* from a Shetland collector. They were undoubtedly *ambigualis*, corresponding in every particular with specimens in my series from Kent, Surrey, Yorkshire, Glasgow, and Paisley. Who is responsible for naming these Shetland insects?—J. W. Tutt, Rayleigh Villa, Westcombe Park, S.E.: *May*, 1887.

Occurrence in Worcestershire of Holocentropus stagnalis, Albarda, a species of Trichoptera new to Britain.—When searching for insects on May 10th, 1886, at Grimley, finding other modes of collecting all but useless, I turned to beating a hawthorn hedge, the leaves of which were about half grown, and soon dislodged a small brownish caddis-fly, which at once settled on the umbrella, closely folding its wings to its body. In this position its wings seemed to be banded with three dark brown fasciæ. Other specimens were obtained in the same way, and when the hedge and some willows on the other side of the lane had been beaten, some dozen specimens had been secured. Near the lane, in a meadow, is a shallow pond, about an acre in extent, closely filled with plants of *Typha*, *Rumex*, *Scirpus*, *Equisetum*, &c., which I supposed, and which proves, to be the natal place of the insect.

When these insects were examined at home they proved to be all ♀. They were evidently a species of *Holocentropus*, and appeared to be the one described in Mr. McLachlan's "Revision and Synopsis" as *H. stagnalis.* Mr. McLachlan concurred in this view, but the matter had to remain over in the absence of the ♂.

Early in May of this year I visited the locality thrice, but without success until the third time (May 9th), when about forty specimens of the ♂ and one ♀ were obtained by sweeping the water plants that could be reached from the margin of the pond, and one ♀ by beating the hawthorn hedge.

In the British specimens of this species the antennæ of the ♂ are much darker than those of the ♀, and the dark markings of the fore-wings are more strongly developed in the greater number of the ♂ specimens, though some are almost uniformly pale golden-brown, which is the condition of fully half of the ♀. In freshly killed ♂ the posterior wings have the cilia and adjoining membrane somewhat rosy, but this is almost wholly lost in drying. The ♂ expands 12—14 mm., the ♀ 16—18 mm.—J. E. FLETCHER, Worcester: *June*, 1887.

[*H. stagnalis* is widely distributed on the continent in flat marshy districts, but is yet only little known.—R. McL.].

Chrysopa stictoneura, Gerstäcker, = Nothochrysa insignis, Walker.—In the "Mittheilungen des naturwissenschaftlichen Vereins für Neuvorpommern und Rügen," xvi (1885), Dr. Gerstäcker described many new Australian forms of *Neuroptera-Planipennia* (= *Megaloptera*), and gave a list of Australian species. The descriptions are, as a rule, excellent, and I have had little difficulty in identifying many species in my collection therefrom. But there are several notable omissions of described species, and others described as new will fall as synonyms, chiefly on account of the insufficiency of the original descriptions.

With regard to *Chrysopa stictoneura*, I venture to think that Dr. Gerstäcker himself has erred in an essential point. The description agrees admirably with *Chrysopa insignis*, Walker, which is a *Nothochrysa*, as I had indicated in Trans. Ent. Soc., London, 1868, p. 208. In fact, the character given for the third cubital cellule in the anterior-wings, viz., "quergetheilt," is almost in itself sufficient to prove this. But another essential character of *Nothochrysa* is that the labrum should be *more or less excised*. Here, I believe, Dr. Gerstäcker has slightly erred in his description of *stictoneura*, for he says, "Oberlippe nicht ausgerandet," and "labro truncato." The excision is only shallow, but, nevertheless, sufficiently conspicuous, and every other character most distinctly agrees with *N. insignis*. Moreover the materials from which Dr. Gerstäcker worked were mostly from the Godeffroy Museum, and were for some time in my hands, and I remember to have noticed *N. insignis* amongst them. Walker's type of *C. insignis* is given vaguely as from "New Holland;" Gerstäcker's type of *stictoneura* is from Rockhampton; I possess two examples, one from Melbourne, collected by Mr. Henry Edwards, the other from Sydney, collected by Mr. E. Meyrick.—R. McLACHLAN, Lewisham, London: *June*, 1887.

Hydroptila femoralis, Eaton, and H. longispina, McLach., probably only one species.—This question mainly depends upon the very probable alteration in the details of the anal parts of the ♂ owing to drying, &c. The anal parts are simple. The most prominent feature is a kind of conical or "boat-shaped" superior lobe. Mr. Eaton (Trans. Ent. Soc. Lond., 1873, p. 137) terms it "trowel-shaped," and he adds, "and there are two long setiform processes for penis-sheaths," but his figure (pl. iii, fig. 5) does not indicate them. He worked almost entirely from fresh insects. In my "Revision and Synopsis," p. 512, I say of the conical lobe that the lanceolate penis lies within it, and the apex of the organ (so considered) is indicated in my figure, pl. lvii, fig. 1. I worked only from dry material. Subsequently Mr. J. J. King took commonly at Ambleside (and since then in several localities in Scotland) a *Hydroptila* possessing most of the characters of *femoralis* (and notably the dark femora), in which the ♂ had the anal parts apparently similar, but there existed two extraordinarily long spines proceeding from beneath the anal lobe, one nearly straight, the other more or less spiral, both apparently chitinous. On this latter character I founded *H. longispina*, McLach., in the "First Additional Supplement" (1884) to my "Revision," p. 71, and what is no doubt an extreme condition is figured there on pl. vii. Latterly Mr. King, when working out the enormous mass of materials he had collected in *Hydroptilidæ*, said that, in his opinion, based on his materials, *H. longispina* should fall as a synonym of *H. femoralis*. And more recently he forwarded a series of specimens from the same localities, some of which should be true *femoralis*, others true *longispina*, and others sufficiently intermediate to induce me to agree with him, unless the contrary can be *proved*. The "two long setiform processes" described by Eaton (but which are not indicated in his figure, and are not visible in his only dry ♂ type that I possess in good condition) no doubt represent what I have considered the intromittent organ and its "sheath," the latter being the *spiral* spine. A question of what may be termed "mechanical anatomy" is involved. Notwithstanding the chitinous nature of these processes, and their great length when fully extended, they must be retractile to an extent that often prevents even the tips of them from being visible. In the case of the spiral spine this could be arranged by coiling up, but the nearly straight one must (so I think) often be absolutely retracted within the abdomen, a process that must need powerful muscles and other internal organization scarcely possible to define owing to the minute size of the insects. My original descriptions of *femoralis* and *longispina* otherwise agree remarkably; even the number of joints in the antennæ is approximately the same in both, a point of some importance, considering the difficulty of counting the joints in antennæ such as these, and the almost practical certainty that the number varies slightly in different individuals.—Id.

Note on Strongylogaster macula, Klug.—Mr. McLachlan has sent me a specimen of this saw-fly, which he captured in his garden at Lewisham on ferns on the 5th of June. I have only once met with the species myself, viz., on the Kilpatrick Hills towards the end of May, and, so far as I know, it has never been taken in England before. I believe the species of *Strongylogaster* live but a very short time in the perfect state, and all, so far as our present knowledge goes, feed on ferns during their larval existence.

Kunow, it may be added, has formed a genus, *Thrinax*, for *S. macula* and its allies; and for *S. delicatulus* another new genus, *Stromboceros*; the name *Strongylogaster* being retained for *filicis, cingulatus*, and *geniculatus* (*cf.* Wiener Ent. Zeit., iv, p. 19). To carry out this system logically it will be necessary to form more genera for certain of the exotic species at present relegated to *Strongylogaster*.—P. Cameron, Sale: *June 17th*, 1887.

Hymenoptera at Ilfracombe.—I have just returned from a week's stay at Ilfracombe, during which the weather was very unsettled, but two or three bright sunny mornings enabled me to catch a few species of interest. What was to me particularly noticeable was the fine condition of some of the spring species of *Andrena*—*A. Trimmerana* and *A. nigroœnea*, for instance, being captured in as good condition as one would expect to meet with them early in April, both sexes were common; in an ordinary year, at the end of May, these species would only occur occasionally and very much worn. I once (*i. e.*, in 1882) took *A. nigroœnea* at Hayling Island in July, but in such a condition that it would be thought a disgrace to many well-ordered collections. I also took, on June 3rd, two specimens of *A. Gwynana* ♀, one of quite the earliest spring bees; indeed, I took the same species at Hastings this spring on March 26th. I was pleased to meet with several specimens of both sexes of *Andrena angustior*, Kirby; they frequented daisies, dandelions, *Veronica Chamœdrys* and *Hieracium pilosella.* Mr. V. R. Perkins takes this species on *Allium ursinum*, but curiously enough, although there was a large patch of *Allium* on the road along which this bee occurs, I never saw a single specimen on it, although I watched for them constantly. Ilfracombe is not a locality which abounds in Aculeate *Hymenoptera.* I suppose the rocky nature of the ground is against them; but I certainly never visited any locality where so few species rewarded one's endeavours to make a collection. — EDWARD SAUNDERS, St. Ann's, Mason's Hill, Bromley, Kent: *June* 10*th*, 1887.

Compsochilus palpalis, Er., at Bromley, Kent.—A specimen of this rarity was captured by me on the 13th, about 6.30 p.m., by sweeping. I believe there are only four records of its capture in this country, viz., Tonbridge and Sheerness, Kent, Wandsworth Common, and Caterham, Surrey. Mr. Champion enumerates these four localities in this Magazine, vol. xii (1875), p. 39. Near where I was sweeping is a small pond, so that the character of the locality seems to be very similar to that in which Mr. Champion found it at Caterham. The Tonbridge specimen also was taken near a damp ditch, so that it would appear probable that this species is to be sought for in damp situations.—ID.: *June* 16*th*, 1887.

Tachinus elongatus, Gyll., at Lincoln.—A few days ago I took a specimen of this rare beetle running on a pavement in Lincoln. This is, I believe, the first recorded capture of the insect in this district.—W. W. FOWLER, The School House, Lincoln: *June* 12*th*, 1887.

Review.

THE BUTTERFLIES OF NORTH AMERICA, by W. H. EDWARDS. Third series, Part ii, 1887. Boston and New York: Houghton, Mifflin, and Co.; London: Trübner and Co. 4to.

The present part is occupied by the following species: *Colias Harfordii*, and its var. (or race) *barbara*, H. Edw., of which there is a complete life-history, illustrated by 24 figures, of which nine are devoted to the perfect insect, and the remainder to egg, larvæ, and pupa. *Argynnis coronis*, Behr, with four exquisite figures for both sexes. A note concerning *A. Callippe*, Boisd. Finally, *Neonympha gemma*, Hüb., and *N. Henshawi*, Edw., the plate containing 25 figures, with full biological details for *N. gemma*. As heretofore, both text and plates bear evidence of the most scrupulous accuracy.

Obituary.

W. C. Unwin.—"We regret to announce the death, on April 23rd, of Mr. W. C. Unwin, of Lewes, at the advanced age of 76. Mr. Unwin was very widely known as an enthusiastic Naturalist. Without aspiring to the rank of a specialist, he possessed a knowledge of nearly every branch of Natural History, such as is seldom attained by the Naturalists of the present day, and he was especially an observer and student of our local Fauna and Flora. In his earliest years (more than fifty years ago) he devoted himself principally to ornithology, both shooting birds and stuffing them. He afterwards turned his attention to botany, and thoroughly investigated our local plants. Subsequently he collected nearly all orders of insects, and in his declining years he took up the study of mosses, in which he did good work. A glance through the list of papers which he read before the Lewes and East Sussex Natural History Society, of which he was at one time a prominent member, will show his versatility—"Summer Birds of Passage," "Humble Bees," "Land and Freshwater Shells," "Raphides," "Hymenoptera," "Collecting Mosses," were among the numerous subjects of which he treated. His published papers were somewhat numerous. In the "Naturalist" of 1853—54 he published a series of papers on the Natural History of Sussex. The lists of insects and plants in Mrs. Merrifield's "Natural History of Brighton" were chiefly compiled by him, and he also contributed several papers at various times to the "Zoologist" and other scientific periodicals. His principal work, however, was "Illustrations and Dissections of the Genera of British Mosses," published in 1878, and illustrated by his own beautifully-executed drawings. He was a skilled microscopist and draughtsman. His studies brought him at various times into communication with most of the principal Naturalists of the day. Of a kind and generous disposition, he was always willing to impart his knowledge to others, and many Naturalists remember with gratitude his ready help. The love of Nature he retained to the last, and he passed peacefully away after protracted suffering."

We take the above from the *East Sussex News* of April 29th, 1887. We are sorry to learn, from private sources, that for several years Mr. Unwin had been unable to follow his avocations, with the result that his widow is in very straightened circumstances. Her case has been taken up by the Rev. W. E. Richardson, of Lewes, who will be happy to give further information.

Entomological Society of London: *June 1st*, 1887.—Dr. David Sharp, F.Z.S., President, in the Chair.

Mr. Philip Crowley exhibited the following specimens of *Diurni*, from the

Kareen Hills, Burmah :—*Papilio Zaleucus*, Hew., *Papilio Adamsoni*, Smith, *Papilio* ? sp. (male and female), and *Nymphalis Nicholii*, Smith.

Mr. T. R. Billups exhibited several specimens of an ant found at Kew, frequenting a species of palm from Tropical Australia, and which had been determined as *Tapinoma melanocephalum*, F.; also living specimens of *Carabus auratus*, from the Borough Market, and of a species of *Blaps* from Northern Africa.

Mr. Waterhouse exhibited a specimen of a Brazilian Locust, *Conocephalus*, ? sp., which he had for some time preserved alive, and which had only died that same morning. He called attention to the change of colour which he had observed in the eyes of this insect; in a bright light they were dirty white or horn-coloured, with a black dot in the middle; but at night, or if the insects were confined in a dark box, they became altogether black; shortly after death, also, the eyes became black. Mr. McLachlan observed that he had noticed a darker spot in the centre of the eye in *Ephemeridæ*, and in other *Neuroptera*. The discussion was continued by Dr. Sharp and others, but no one seemed to be able to account for the alteration in question.

Lord Walsingham exhibited specimens of *Cateremna terebrella*, Zk., a species lately taken by himself in Britain, and recorded in Ent. Mo. Mag., xxiii, p. 82.

Mr. Meyrick read two papers "On *Pyralidina* from Australia and the South Pacific" and "Descriptions of some exotic *Micro-Lepidoptera*." In these papers about sixty new species were described. A discussion ensued, in which Dr. Sharp, Mr. Stainton, Mr. McLachlan, and others took part. Mr. Meyrick stated that, as far as the *Pyralidina* were concerned, Australia could not be regarded as a separate region, for a large number were not endemic, but appeared to have been introduced from the Malay Archipelago. The method of this immigration seemed doubtful. Mr. Meyrick was of opinion that the insects flew very long distances, and effected a settlement through their food-plant being widely distributed and common. He instanced the undoubted immigration of certain Australian species into New Zealand, a distance of 1200 miles. Mr. Stainton adduced the instance of *Margarodes unionalis*, which is a South-European insect, feeding on the olive, yet is occasionally found in Britain. Mr. Meyrick, in connection with his papers, exhibited *Oxychirota paradoxa*, Meyr. (unique specimen representing the family *Oxychirotidæ*), *Epharpastis dædala*, Meyr., and *Mixophyla erminea*, Moore. Mr. Meyrick also made some observations on the distribution of the insect fauna in the various regions of Australia; he said that it appeared to be more or less different in certain defined portions of the Continent, which might be roughly regarded as oases in the midst of desert districts: all his observations, however, had tended to upset Mr. Wallace's theory that Eastern and Western Australia were originally separated, as the gradations in the insect fauna from east to west were quite gradual; in Western Australia the *Tineina* were the only group well represented by peculiar endemic forms.

Mr. Pascoe read a paper "On the genus *Byrsops*," a genus of *Curculionidæ*.

The President announced that Lord Walsingham's collection of *Lepidoptera* and larvæ, recently presented to the nation, would be exhibited in the Hall at the Natural History Museum, South Kensington, until the end of June.—W. W. Fowler, *Hon. Secretary*.

ON CERTAIN SPECIES OF *COLEOPTERA* NEW TO BRITAIN, OR REINSTATED.

BY THE REV. W. W. FOWLER, M.A., F.L.S., &c.

Homalota consanguinea, Eppelsheim.

This species appears to form a connecting link between the *H. longicornis* and *H. sordida* groups; in the European catalogue of Heyden, Reitter, and Weise it is placed in the sub-genus *Coprothassa*, which contains besides *H. sordida* and *H. melanaria*; it differs, however, from these latter species in the shape of the thorax, which is much less narrowed in front, and in the sculpture of the hind-body, which moreover is less narrowed behind; the following is a detailed description:—Pitchy-black or brownish, with the thorax slightly lighter, the elytra reddish or reddish-brown, and the apex of hind-body broadly testaceous; head rather large, finely but not very closely punctured; antennæ long and stout, pitchy-black, with base sometimes ferruginous; joints 2—3 of about equal length, much longer than 4th, 5—10 not differing much in length, the penultimate being about as long as broad, last joint long, pointed, at least as long as the two preceding together; thorax transverse, with sides rather evenly and not strongly rounded, and not strongly narrowed in front, the apex being nearly as broad as the base, punctuation fine; elytra about as long as thorax, finely sculptured; hind-body not strongly narrowed behind, very finely punctured, less evidently at apex than at base; legs clear testaceous-yellow.

Length, 2½—3 mm.

Three specimens of this rare continental species were taken by Mr. E. Saunders, at Hollington, near Hastings, in 1871. M. Fauvel, who kindly determined the species for me, expressed his surprise at its occurrence in Britain, as it has hitherto been confined to Eastern Germany and Austria.

Scopæus cognatus, Muls. et Rey.

This species very much resembles *S. pusillus*, but may be known by the slightly longer elytra, and by having the intermediate tibiæ somewhat dilated, and also by the characters of the 7th segment of the hind-body in the male; in *S. pusillus* this is rather deeply and angularly, but simply, emarginate; in *S. cognatus* the emargination is rounded at apex, and is bounded by two strong arched impressions, converging in front, which make the edges of the emargination appear raised.

Length, 2½ mm.

One specimen taken by Mr. E. Saunders, at Ventnor, Isle of Wight, and another kindly sent to me by M. Fauvel, who, I believe, obtained it from M. Javet's collection; it is labelled "Wingham," which is a village near Sandwich.

Bledius dissimilis, Er.

This distinct species of *Bledius* belongs to the section in which the thorax has no central impressed channel, but in its stead a smooth central line, which sometimes appears slightly raised; hitherto we have only possessed as British two species of this group, *B. crassicollis* and *B. erraticus*. *B. dissimilis* may be at once known from the latter by the much coarser punctuation of the thorax, and from the former by having the elytra longer than the thorax, and by the fact that the posterior angles of the latter are more rounded; in all the specimens that I have taken the elytra are yellowish or testaceous, with a slight red tinge, with the suture more or less broadly dark; occasionally the dark colour covers nearly the whole of the elytra: this appears to be the v. *nigricans*, Er.; the chief distinguishing character, however, lies in the two long spines which are situated at each side of the 6th ventral segment of the hind-body of the male, and which are plainly visible from above: they are slender and curved at apex, and are very conspicuous; in *B. erraticus* they are entirely absent, and in *B. crassicollis* take the form of short teeth; *B. dissimilis* appears to be most nearly related to *B. cribricollis*, a species not hitherto found in Britain, but which is common in the northern provinces of France; it differs, however, from the latter species in its less red elytra, the suture of which is more broadly darker, in its more closely punctured thorax, of which the interstices are not quite so smooth, and in its shorter antennæ, of which the penultimate joints are more transverse. Length, 3½ mm.

As long ago as 1878, soon after I commenced collecting, I took two or three specimens of this species at Bridlington, Yorkshire, which were named for me as *B. erraticus*; in 1884, I found the species in the same locality in large numbers, and discovered that it certainly was not *B. erraticus*, nor did it agree with *B. crassicollis.* I afterwards determined it from Mulsant and Rey's "Brévipennes" as *B. dissimilis*, and a specimen I sent to M. Fauvel was also returned to me by him with this name; the only point that seemed doubtful was the fact that the long spines in the male are represented by Mulsant and Rey as curving outwards, whereas in my specimens they are larger than in their figure, and curved inwards; in all other points, however, the insect quite agrees with their description. The species occurs in great numbers at Bridlington, where its casts may be found on the sides of the dark clay cliffs, from their tops nearly to the shore line; it is never found in the sand with *B. arenarius*, which is also very abundant. Together with the perfect insect I found the larvæ and pupæ, the latter in little cells with polished sides formed in the clay; I know of no other British locality but Bridlington for this insect, and it is strange that it has not been recorded before: others of the rarer *Bledii*, such as *B. crassicollis*, have been found in only one or two localities, and in these in some numbers, so that it is most probable we shall find other species in Britain, such as *B. cribricollis*, &c.

BYTHINUS VALIDUS, Aubé.

Very like *B. puncticollis*, but distinguished by the characters of the male, which has the first joint of the antennæ slightly shorter, and without a dentiform appendage at apex, the femora strongly thickened, and the tibiæ robust, the posterior pair being of equal breadth throughout; the thorax is rather broader in proportion than in the preceding genus, and the colour, as a rule, is said to be darker, but this is by no means a reliable character, as it is variable; in *B. puncticollis* the male has the two basal joints of the antennæ thickened, the first armed with a small dentiform appendage on its internal apex, and the femora ample. Length, 1⅓ mm.

Found under the same circumstances as *B. puncticollis*, and apparently widely distributed and mixed with that species in collections; in Dr. Sharp's collection there are specimens from Bishop's Wood and Hampstead, as well as from several Scotch localities, and I have specimens from Bretby Wood, near Repton, Burton-on-Trent; it is evidently the insect referred to by Denny (Mon. Psel. et Scyd., p. 26) as the female of "*Arcopagus puncticollis*," of which he says, "thighs very thick in female," although what could have led him to the determination of the sex it is difficult to say.

MICRAMBE ABIETIS, Payk.

There appears to be some doubt regarding this species, which has before been introduced into the British list on the authority of large specimens of *Cryptophagus vini*; a specimen named for me on the continent as *M. abietis* appears to me to differ in no point from the species just mentioned, but I believe that Mr. Blatch and Dr. Capron have both taken the insect in the London district: it is larger, with shorter and less thick pubescence, and the anterior angles of the thorax not produced into a tooth behind; the elytra also are more finely and closely punctured. Length, 1½ mm.

The species occurs on pine trees; the habitat, therefore, appears to be different from that of *C. vini* (which species must also be referred to Thomson's genus *Micrambe*). I feel, however, almost certain that I have found *C. vini* on low-growing firs.

ATOMARIA RHENANA, Kr.

Closely allied to *A. basalis*, but broader and more convex, with the thorax rufous and the testaceous colour of the elytra reaching further towards the base; the antennæ are rather shorter and stouter; the thorax has the sides more slightly rounded, and almost angularly dilated about the middle, and the elytra are considerably broader and more widened before the middle. Length, 1½ mm.

This species has occurred at Great Yarmouth, Shoreham, Brighton, and Bognor; it appears certainly to be a good species, although it has been altogether omitted from the British list as being a variety of *A. gutta* (from which it is quite distinct), and is given as a variety of *A. basalis* in the European catalogue of Heyden, Reitter, and Weise.

MELANOPHTHALMA (CORTICARIA) SIMILATA, Gyll.

Very like *M. fuscula*, but easily distinguished by the shape of the thorax, which is nearly as long as broad, and usually has three foveæ at the base, of which the lateral ones are more or less obsolete; the sculpture of the elytra is much stronger, and the alternate interstices are raised and somewhat carinate, especially near suture: the colour of the type form is more or less ferruginous, but the insect varies both in this point and in size. Length, $1\frac{1}{2}$—$1\frac{3}{4}$ mm.

One specimen of the type form is in Dr. Sharp's collection, without locality, and another of the larger dark variety is in the same collection, from Braemar.

M. FULVIPES, *var.* MERIDIONALIS, Reitter.

The type form of *M. fulvipes* is pitchy-black, and rather larger than is the case with any of our specimens, all of which must apparently be referred to the *var. meridionalis*, Reitter, by reason of their small size, and lighter, reddish, colour.

LÆMOPHLŒUS PUSILLUS, Schön. (*longicornis*, Marsh.).

Rather larger than *L. duplicatus*, to which it is somewhat closely allied, and distinguished by having only one impressed line on each side of the thorax, and by the fact that the antennæ of the male are almost as long as the whole body; the elytra also are more plainly striated, and the general form is broader.

Length, $1\frac{1}{2}$—$1\frac{3}{4}$ mm.

In granaries; imported with corn; found by Mr. Fitch, at Maldon, Essex. These granary beetles are very unsatisfactory to deal with, but if one is introduced into the British list, others must be, and we already have a considerable number of cosmopolitan insects in our catalogues.

AGARICOPHAGUS CONFORMIS, Er.

In Dr. Power's collection there are three or four specimens of *Agaricophagus* labelled *conformis*: one of these I sent to Herr Reitter, who has recently revised the whole of the *Anisotomina*, and he has confirmed it for me as that species; it appears plain, therefore, that we possess as British what is regarded as *A. conformis* on the continent; the species was introduced many years ago by Mr. Crotch, but afterwards given up, on the ground that the specimens were only forms of *A. cephalotes*; the general differences appear to be very slight, *A. conformis* being smaller, and of a shorter oval form than *A. cephalotes*, with the head smaller and the thorax more narrowed in front; the elytra also are more thickly cross striated; the head, however, varies in size in the sexes, and, therefore, is not a dependable character; in the male, however, *A. cephalotes* has the posterior femora dilated, emarginate beneath, and armed in the middle with a recurved tooth, whereas in *A. conformis* they are only armed with a minute tooth at apex: the species is so very rare that it is impossible to get many specimens for comparison, and at present I am not at all sure that we possess more than one British species, whether it be *cephalotes* or whether it be *conformis*.

ANISOTOMA RUBIGINOSA, Schmidt.

This is another of the doubtful species that have been alternately introduced into the British catalogue and afterwards given up: it is a very convex, globose-ovate species, and is distinguished by having the thorax more convex than the elytra, by the very fine, and at the same time diffuse, punctuation of the thorax, and by the almost invisible punctuation of the interstices of the elytra. There is a specimen in Mr. Mason's collection which was returned to me from the continent as "près *rubiginosa*;" it is not sufficiently distinct to form a new species, but must, I think, be referred to *A. rubiginosa*.

It may, perhaps, be here remarked that *A. oblonga*, Er., and *A. grandis*, Fairm., are now united by the chief continental authorities, and also that *A. obesa*, Schmidt, appears to be considered as in all probability identical with *A. dubia*, Klug, and *A. similata*, Rye, as a form of *A. badia*, Sturm.

Very little is usually known about the difference between *Cyrtusa minuta*, Ahr., and *C. pauxilla*, Schm.: the former is a larger, less elongate, and more convex insect, with the posterior tibiæ gradually widened to apex, and the posterior angles of thorax right angles; it has been taken at Scarborough and in the Solway district of Scotland, but very rarely; the latter is evidently smaller, more elongate, and less convex, with the posterior tibiæ abruptly widened at apex, and the posterior angles of thorax obtuse; it is not uncommon in the London district in several localities, and has been taken at Hastings and in the New Forest. Most of the specimens standing in our collections as *C. minuta* ought probably to be referred to *C. pauxilla*.

ADALIA (COCCINELLA) OBLITERATA, L., *var.* FENESTRATA, Weise.

In Dr. Power's collection there are two specimens of this very distinct variety of *Adalia obliterata*, L.: it is quite black, with the apex of the elytra and a few more or less distinct spots at margins and on disc of the same yellowish or yellowish-red, and the anterior angles of the thorax somewhat broadly whitish.

The specimens were taken at Northampton, on ling, by the Rev. Hamlet Clark.

A. BOTHNICA, Payk., *var.* CRUCIFERA, Weise.

Most Coleopterists who are acquainted with Dr. Power's collection will remember a rather small, hemispherical, yellowish *Coccinella* labelled "like *variabilis*, but not it," which Dr. Power used to set great store by, and often endeavoured to get identified: this specimen has lately been named for me by Herr Reitter as *Adalia bothnica*, *v. crucifera*, Weise, a species which occurs in northern Europe, the mountainous districts of central Europe, and in Siberia. Dr. Power's specimen is from Moss Morran, Scotland. The genus *Adalia* differs from *Coccinella* proper in having the prosternum convex, and without carinæ, whereas in the latter genus the prosternum is depressed between the coxæ, and furnished with two carinæ; hitherto only two species have been known as British, *A. obliterata* and *A. bipunctata*. *A. bothnica* is almost circular and hemispherical. Head and thorax yellow, with distinct black markings, which are more or less confluent; elytra yellow, with the suture and six patches on each black; the side margins also, until a third before apex, are black; in the variety two of these patches on each elytron are free, two join the margin, one touches the apex, and one the suture at middle: the suture and the two patches that join it form a rough cruciform figure; the legs are pitchy; the elytra are closely and rather distinctly punctured. Length, 3½—4 mm.

Lincoln: *June*, 1887.

SUPPLEMENT TO ANNOTATED LIST OF BRITISH *ANTHOMYIIDÆ.*

BY R. H. MEADE.

(*Continued from Vol.* xxiii, *p.* 253).

HYLEMYIA, R. Desv.

H. COARCTATA, Fall.

The larvæ of this species have been found in the stalks of wheat, upon which they feed, often doing great damage to the crops. In May, 1882, I bred several of these flies from young wheat plants (infested by little maggots) which were sent to me by Mr. Creese, of Teddington, near Tewkesbury, at the request of Miss Ormerod.

CHORTOPHILA, Macq.

C. SYLVESTRIS, Fall.

This large species has been recorded as British by Mr. Verrall, in his "Hundred new British species of *Diptera*." It is a mountain species which he captured in Scotland, closely resembling *Hydrophoria conica* in shape, size, colour, and markings; it may, however, easily be distinguished from it by the scales of the alulets being much smaller and equal in size, by the arista being pubescent instead of plumose, and by the eyes being approximate in both sexes, instead of being contiguous in the males and widely separated in the females, as in *H. conica*. As I before mentioned in my list, Schiner placed this species, together with *C. Billbergi*, in the genus *Eriphia*, Mgn.

C. TRAPEZINA, Zett.

Mr. Verrall, in his "Hundred new species," has recorded the capture of *A.* (*Phorbia*) *striolata*, Fall., and remarks that it is the same as the fly that I had named *C. trapezina*, Zett. It is exceedingly difficult to determine the identity of many species that have been only shortly and insufficiently described, and I allow that my specimens do not correspond exactly with some that I have received from the continent under the name of *C. trapezina*, the central marks on the back of the abdomen being larger and more quadrate in the continental specimens than in the English ones, where they are triangular in form; still I cannot make them agree with the descriptions given of *P. striolata*, Fall., of which Zetterstedt says, "Valde similis *A. radicum*,"* in which the abdomen is marked by strong transverse black lines in addition to the longitudinal dorsal stripe.

C. CINEREA, Fall.

In my notes on this fly I find that I have mixed up the male and female of two distinct species. The one that I took for the male of *C. cinerea* being really that of *P. cepetorum*. I discovered my error by breeding a number of both males and females of the latter species from onions, when I found that the male flies were identical with those that I had named *C. cinerea*, while the females were quite distinct. In colour, markings, &c., the two species are very similar, but the females of *C. cinerea* are larger than those of *P. cepetorum*, and differ as well by the following points of structure. The arista in *C. cinerea* is distinctly pubescent

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* Zett., Dipt. Scand., tom. xiv, fol. 6242.

throughout its entire length, while in *P. cepetorum* it is only slightly hairy for a short distance beyond the thickened base. The fronto-orbital bristles* are differently arranged in the two species. In *C. cinerea* the upper series (three in number) is placed on an outer line to the lower series, and turns outwards; the bristles in the lower series are also much smaller than the upper ones, are five or six in number, and turn inwards. In *P. cepetorum* the bristles in the upper and lower series form one extended, though curved, line; they turn, however, in opposite directions as in the other species, but there is less difference in size between the bristles in the two series, and those in the lower one are only three (sometimes four) in number. The edges of the second and third abdominal segments have larger and longer bristles in *C. cinerea* than in *P. cepetorum*; the wings also differ in the two species—in *C. cinerea* the third and fourth longitudinal veins are slightly divergent at their extremities, while in *P. cepetorum* they are quite parallel, and the third reaches the border exactly at the apex of the wing, while in *C. cinerea* it ends a little before the apex.

The males belonging to *C. cinerea* are still unknown to me.

C. LONGULA, Fall.

Zett., Schin., Rnd., *non* Meig., *nec* Macq.

This is a well-marked little species, of which I have only seen a single male, which was given to me by Mr. Brunetti, and captured by him at Balham in August, 1885. It has a narrow cylindrico-conical abdomen, marked on the dorsum with a longitudinal row of narrow triangular spots. The thorax has two dark longitudinal lines on the dorso-central region placed rather widely apart, which are formed by a series of brown spots surrounding the roots of the outer row of the dorso-central bristles. The characteristic peculiarity of this species, however, is the clouding of the transverse veins of the wings, by which it somewhat resembles *Hylemyia pullula*, Zett., and with which it was confounded by Meigen and Macquart. The face and forehead are not very prominent in this species, so it will come under my second section. Rondani has remarked this, but Schiner has fallen into the error of placing it next to *C. buccata*.

PHORBIA, R. Desv.

P. DISCRETA, Meig.

Mr. Verrall has recorded the capture of this species, of which he kindly sent me specimens. It is well marked, characterized by the eyes of the male being rather widely separated (sub-contiguous), by the thorax being striped with five rather indistinct lines, by the abdomen being flat, having brown reflexions, being marked by an interrupted longitudinal dorsal band, and black transverse lines, and by the wings being brunescent.

P. VETULA, Zett.

Mr. Verrall has also recorded the capture of this species, but, as he remarks, there is some doubt respecting it. I think it is probably an undescribed species.

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* See Osten-Sacken's "Essay of Comparative Chætotaxy."

P. IGNOTA, Rond.

Both males and females were bred by Mr. Inchbald in June, 1885, from the flower heads of ragwort.

PEGOMYIA, R. Desv.

P. SILACEA, Meig., Schin.,

(*olim P. diaphana*, Auc.).

Mr. Verrall has recorded the capture of this rather rare species in Britain, and since my last list was published I have found it myself near Bradford, as well as in Oxfordshire, and have also received a specimen from Miss Prescott Decie, found near Tenbury. This species has been mixed up by authors with the *Musca flaveola* of Fallén, which it somewhat resembles. I placed the latter in the first part of my list in the genus *Mydæa*, but there have been great differences of opinion as to its proper position; Schiner arranges it among his *Limnophoræ*, under the specific name of *diaphana*, and as the eyes in some specimens are slightly hairy, it has also been classed among the *Ariciæ*. Under these circumstances I think it will be better to place it, together with its congener (*P. silacea*), in the genus *Pegomyia*. Both species have moderate and unequal sized scales to the alulets, and will therefore come into my first division of that genus. Fallén and Zetterstedt place them next each other, and the descriptions of these species have been so mixed up, that the synonymy has become very confused.

I had a most interesting correspondence at the beginning of last year with Professor Mik, of Vienna, respecting these two species, and from the information which I thus obtained, as well as from the interchange of specimens, I hope I may be able to clear up the subject. In the first place the name *diaphana* has generally been supposed to have been applied by Wiedemann to the less highly developed species which we now propose to call *silacea*; but, on Prof. Mik examining the types (of which he found three) in the Wied. Collection in Vienna, he found that they all (though named *diaphana*) belonged to the more highly developed species, the *M. flaveola* of Fallén. This being the case, Prof. Mik suggested to me that the name *diaphana* had better be dropped, for it is really only applicable to *M. flaveola*, which has a translucent abdomen, while the other has not, and it would lead to much confusion to transpose the names entirely. Meigen having described the less highly developed of these species in his 7th volume, under the name of *A. silacea*, and Schiner having followed him, Prof. Mik thought that we had better adopt this title; he promised to publish some observations himself upon the subject, but as he has not yet done so, I have pleasure in following his suggestion.

Before endeavouring to clear up the synonymy, I think it will be better briefly to point out the principal points of distinction between the two species, as neither of them have been fully described.

P. FLAVEOLA.—Frontal triangle in male mostly black, but occasionally red (young spec.?); eyes contiguous, and sometimes slightly pubescent; frontal space in female occupying about one-third of the width of the head, and also mostly black; face glistening white in both sexes; antennæ with two basal joints yellow, and third joint black in both sexes; arista shortly ciliated, in some specimens nearly bare; thorax testaceous and glabrous, showing the spur of a white central stripe on its front margin, and having four bristles behind the suture in the outer dorso-central row; abdomen oval, yellow, and translucent, sometimes a little infuscated on the back of the fourth and fifth segments, otherwise immaculate, edges of the second and third segments destitute of bristles on the dorsum; legs yellow, with the exception of the tarsi, all the joints of which are black; hind tibiæ of the males with a strong black spur or spine projecting from their inner ends; wings with the external transverse veins rather oblique, and sometimes a little sinuous; the internal transverse vein is placed a little before the termination of the auxillary vein.

P. SILACEA.—Frontal triangle in the male, as well as frontal space in the female, yellow; eyes contiguous in the male, and quite bare; face yellowish-white; antennæ entirely yellow in the male, but with third joint black in the female; arista shortly ciliated, length of hairs about the same as in the former species; thorax of a dead whitish-yellow colour, which is lighter at the fore part; unstriped; bristles in the dorso-central rows small, only three in the outer row behind the suture; abdomen small and flat, dull yellow, and when viewed in certain lights showing a wide dorsal interrupted stripe* as well as transverse dark lines; all the segments are furnished with a thick even row of black bristles on their posterior edges; legs yellow, with the exception of the last four joints of the tarsi; metatarsi pale; there is no spine on the inner extremity of the hind tibiæ in the male; wings, with the external transverse veins very oblique in the male, so that they lie almost parallel with the posterior borders of the wings, they are also very sinuous, being bent like the letter S; in the female these veins are much less oblique and sinuous than in the male; internal transverse veins placed exactly opposite the termination of the auxillary vein.

A comparison of the two descriptions will show that the species are widely different, and that one is more highly developed than the other. Only knowing the former when I published my list, I placed it in the genus *Mydæa* on account of the shape of the abdomen and size of the alulets, &c. Prof. Mik thinks that it should be classed among the *Ariciæ* (*Hyetodesiæ*, Meade), on account of the slight hairyness of the eyes, and he called my attention to the fact that H. Loew has described this fly as a new species by the name of *Aricia aculeata*,† giving this specific name from its having the spurs on the hind tibiæ. The almost nude state of the arista scarcely fits this species to hold such a position, and in the present unsettled, and I may say unsatisfactory, state of the generic distribution of the *Anthomyiidæ*,‡ I think it will be better to place both species provisionally in the genus *Pegomyia*, which is already a very artificial group, including some species that are much more highly developed than others, but have the abdomen and legs yellow.

I will conclude these remarks with giving a sketch of what I believe to be the correct synonymy of these species.

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* Meigen mentions this in his description of *A. silacea*, but it is omitted by Schiner; who says, however, that the abdomen shrinks up in drying and becomes short; this probably caused him to overlook the stripe.

† Berl. Entom. Zeitschr., 1873, pp. 33—52. Diptera nova a F. Kowarzio capta.

‡ M. J. Schnabl, of Warsaw, has lately published an elaborate memoir upon the genus *Aricia*, the scope of which he proposes greatly to enlarge. He considers the presence of hairs upon the eyes an insufficient generic distinction.

PEGOMYIA FLAVEOLA.

Syn. *Musca flaveola*, Fall.
Anthomyza flaveola, Zett.
Anthomyza varians, Zett.
Anthomyia diaphana, Wdm. et Meig.
Pegomyia diaphana, Macq.
Limnophora diaphana, Schin.
Aricia aculeata, Lw.
Mydæa flaveola et *varians*, Meade.

PEGOMYIA SILACEA.

Syn. *Anthomyia silacea*, Meig. et Schin
Anthomyia diaphana, Rond.
Musca diaphana ?, Fall.
Anthomyza diaphana, Zett.

P. FULGENS, Meig.,
Macq., Rond., Wlk. ?, *non* Schin.
A. limbatella, Zett.

This appears to be a rare species. I have only seen one specimen, which I captured some years ago upon Shirley Heath. It is characterized by having the palpi yellow with black tips, as in *P. nigritarsis*, Zett., which species it a good deal resembles, but from which it differs by having the shoulders and scutellum yellow, and the abdominal segments of the female marked by transverse black lines.

P. HYOSCYAMI, Panz.

I bred two females of this species from larvæ which had mined, or rather blotched, the leaves of garden beet in August, 1886. This shows that phytophagous insects do not always confine themselves very closely to plants of the same family.

(To be continued).

LOBESIA PERMIXTANA OR *RELIQUANA*: ITS SYNONYMY AND HABITS.

BY H. T. STAINTON, F.R.S.

Hübner figured this *Tortrix*, his No. 75 (before the year 1801), under the name of *permixtana*. He subsequently figured another insect as *permixtana*, his No. 187, under the impression that the latter was really the *permixtana* of the Wiener Verzeichniss, and not wishing to have two species both bearing the name of *permixtana*, he, in 1816, in his Verzeichniss bekannter Schmetterlinge, proposed the name *reliquana* for his earlier figured species No. 75, so long known in this country and abroad as *permixtana*.

Stephens, in his Museum Catalogue of *Tortrices*, published in 1852, reverted to the name given by Hübner in his Verzeichniss to his figure No. 75, and hence *reliquana* came into our lists, but the *reliquana* of Hübner never did mean anything but *permixtana*, Hübner, No. 75, as distinct from *permixtana*, Hübner, No. 187.

Treitschke, very unintentionally no doubt, helped a little to increase the confusion. He was very probably unacquainted with the insect now under consideration. He described a *reliquana* and gave as synonyms Hübner's *permixtana*, fig. 75, and the *reliquana* of Hübner's Verzeichniss bekannter Schmetterlinge.

Treitschke's insect was evidently something different from ours, and from his notice of the larva was clearly the vine-feeding *Tortrix* now known as *botrana*, yet Treitschke thought that Hübner's fig. 75 represented a *female* of his species, whereas Hübner's figure with the two black triangular marks on the inner margin of the anterior wings, and with the *white posterior wings*, is manifestly the *male* of our well-known *permixtana*.

As in these days the *permixtana* of the Wiener Verzeichniss, and the *permixtana* figured by Hübner 187, seem alike lost to science, there seems no reason why Hübner's name of *reliquana* should not be dropped, and the name *permixtana*, given by him to his figure No. 75, restored to that insect.

It must, however, always be borne in mind that *Lobesia reliquana* of Wilkinson's British Tortrices, p. 280, and *Lobesia reliquana* of Stainton's Manual, II, 226, are identical with *Lobesia permixtana* of Staudinger and Wocke's Catalogue, p. 251, with *Grapholitha* (*Lobesia*) *permixtana* of Heinemann, p. 138, and with *Lobesia permixtana* of Snellen's De Vlinders van Nederland, Micro-Lepidoptera, p. 277.

German Entomologists seem to have generally overlooked the imple fact that *reliquana* was a synonym of Hübner's creation for his own *permixtana*, No. 75, and that, consequently, *reliquana* of *Hübner* has no separate existence from that insect; the pretty moth of which I am treating is therefore both the *permixtana* and the *reliquana* of Hübner.

Now as to the habits of the species. Haworth, Lepidoptera Britannica, p. 406, says only: "Habitat apud nos infrequens." He mentions the black-tipped white hind-wings, and the black hind-wings, uggesting that these may indicate the sexes, but he says nothing of localities or times of appearance.

Stephens, in his Illustrations, Haust. IV., p. 183, says: "Not very uncommon, in June, in the woods of the metropolitan district, frequenting open places and hedges; found also in plenty in the New Forest, Devonshire, &c."

Wilkinson, in his British Tortrices, p. 280, says: "Not a very common species; slightly variable in size, but tolerably constant in colour and markings. The imago appears in May in woods and hedges flying in the sunshine. It occurs at Darenth and Swanscombe Woods at Dulwich, and other places round London; at Epping and the New Forests, Devonshire, &c." In the Manual of British Butterflies and Moths, II, p. 266, I give the time of appearance "May," and add "Widely distributed, and not scarce in the South; flying in the sunshine."

Herrich-Schäffer, who adopts in his Schmetterlinge von Europa the name *Fischerana* for this species, says of it (vol. iv, p. 225): "In Mecklenburg, Bohemia, also near Ratisbon in the valleys of the Laber and the Danube; in May and June." Heinemann, in his Schmetterlinge Deutschlands und der Schweiz, Wickler, p. 138, says: "More in the North of Germany, in May and June, and again in August, among sloe." On this I must remark that I much doubt its being double-brooded.

Hartmann, in his Kleinschmetterlinge der Umgegend Münchens p. 36, gives the somewhat startling information: "larva from September to May in the swollen knots on the stems and branches of *Juniperus communis;* imago June and July," but surely some other species must here be meant. Rössler, in his Lepidoptera von Wiesbaden, p. 247, says: "Throughout May on the margins of woods, in thickets and hedges; in the years 1857—59 almost common, since then, scarce."

Jourdheuille, in the Annales Ent. Soc. France, 1870, p. 127, says of *Lobesia permixtana*: "larva on *Anchusa officinalis*," a food-plant which is assigned by Rössler to the species he places immediately after *permixtana*, *Lobesia artemisiana*, the *Eudemis artemisiana* of Staudinger and Wocke's Catalogue.

Brischke, in the Stettiner Entomologische Zeitung, 1876, p. 68, says that he bred *Lobesia permixtana* from a larva "found August 21st, 1871, in the tips of the stem ("in den Stengelspitzen") of *Solidago virgaurea.* The larva was about 8 mm. long, pale brown-grey or brown-red; head and following segment shining brown, the latter with a pale central streak; anal shield shining brown. When full fed it entered the earth and spun a longish cocoon. The imago appeared on the 11th April, 1872." I presume it had been kept in a warm room.

I would remark here that Herr Brischke, of Danzig, only seems to have found a single larva, and though his note was not published till nearly four years after the appearance of *the first permixtana reported to have been bred*, he does not appear to have met with any more of the larvæ. The observation may be a good one, but it is extremely desirable to have it confirmed by those who have opportunities of collecting in August amongst *Solidago.* Snellen, in De

Vlinders van Nederland, Micro-Lepidoptera, p. 278, says: "May, June, and then in August, not common," and at p. 277 he says: "The insect flies in the early summer, and again in the after-summer. Two generations." But I hope my friend Herr P. C. T. Snellen will excuse me, when I confess that I am still very incredulous about these two broods.

I come now to my own experience of this insect; my six oldest specimens were all taken prior to 1850, and four of them before 1848, which was the first year when I labelled my captures. Hence, I have no record whatever of the origin of these four. In 1848 I took one specimen at West Wickham Wood, June 9th; in 1849 I took one at Torwood, near Larbert, Stirlingshire, June 5th. Thirty-five years elapsed before I again met with the species, but, in 1884, I captured a single specimen in a little wood at Pitlochry, Perthshire, June 27th, this wood was of mixed growth—oak, birch, mountain ash, &c., with a considerable variety of low plants.

This summer, on the 10th June (a very bright hot day), I visited that same wood at Pitlochry in the evening and found *Tortrices* freely on the wing, especially *Capua ochraceana*, *Anchylopera Mitterbacheriana*, and, above all, *Lobesia permixtana*; all the three seemed partial to oak, which I was well aware was the special food of *Mitterbacheriana*, and I could not fail to notice whilst boxing one specimen of *permixtana*, I should frequently see two or three others, or more, buzzing at the oak-shoots (one always does see more insects when both hands are fully engaged than at any other time), so that I might easily have jumped to the conclusion that there was a distinct connection between the oaks and *permixtana*. Mr. Barrett, in his "Notes on British Tortrices," had already remarked that our *permixtana* seemed partial to oak (Ent. Mo. Mag., xi, 62).

However, I called to mind that *Elachista albifrontella* is very apt to swarm on oak-shoots, and as we all know that its larva, however many grasses it may eat, has nothing to do with oak, the swarming of an imago on a plant *proves* nothing as to the food of the larva.

I had not then taken notice of Herr Brischke's observation of the larva on golden rod, but, if I am not mistaken, the *Solidago* does occur in this wood at Pitlochry. Of the specimens of *Lobesia permixtana* I captured that evening (a few were so worn that they were useless) I set out nine, and hoped to have taken more on subsequent evenings, but the next day we had a complete change of weather with high wind, and few insects were on the move, and on the evening of the 12th, though I did see a few *permixtana* flying at random (not buzzing on the oak shoots) I failed to catch any. On the 13th June I left Pitlochry.

Mountsfield, Lewisham:
July 7th, 1887.

A NEW SPECIES OF *NEPTICULA* BRED FROM BIRCH, FROM HEREFORDSHIRE (*N. WOOLHOPIELLA*).

BY H. T. STAINTON, F.R.S.

In August, 1886, Dr. J. H. Wood, of Tarrington, sent me som *Nepticula*-mines in birch leaves, which I was unable to determin Early in September he sent me a further supply of the same mine some being still tenanted by the larvæ. Of the mines some had considerable resemblance to those of *N. subbimaculella*, but the min commenced with a small dark blotch, much like that of *N. continuell* The larva (as described by Dr. Wood) was very pale green.

From the observations made by Dr. Wood, I learn that in habi this larva showed a difference from the larva of *N. argentipedella*, th latter being apparently a very sluggish feeder, seldom to be see eating, and usually hidden beneath the dark central portion of th mine; whereas, the larva of the unknown novelty fed up much mor quickly, and was always to be found with its head at the margin o the mine, either actually eating, or just ready to eat.

The larvæ which Dr. Wood so kindly sent me last September die without forming their cocoons. Dr. Wood was more fortunate: h supplied some of his larvæ with earth, and kept them out of door during the winter, and from these he has succeeded in breeding fou specimens of the imago.

These are smaller than *argentipedella*, with the apical half of th wing blacker, the fascia brighter (that is, more silvery), and rathe more oblique on its inner edge; in *argentipedella* the fascia generall expands a little towards the base on the inner margin of the wing which gives the inner edge of the fascia a rather concave appearance in the new birch-feeder the inner edge of the fascia has not this concave appearance, it being nearly straight, though oblique.

As this insect has been first detected in Herefordshire, in the paris of Woolhope, I propose for it the name of *Nepticula woolhopiella*.

Mountsfield, Lewisham, S.E.:
July 7th, 1887.

THREE NEW LONGICORN *COLEOPTERA* FROM SOUTH AMERICA

BY H. W. BATES, F.R.S.

The species here described belong to the group *Onocephalini* Family *Lamiidæ*. The genus *Stethoperma* was established by M Lameere in the Annales Belges for 1884, vol. xxviii, p. 93, on th species *S. Candezei* and *S. Batesi*.

STETHOPERMA MULTIVITTIS.

Suprá olivaceo-ænea, capite suprá et thorace vitta mediana, elytrisque vittis plurimis alteris longitudinalibus alteris obliquis, fulvo-tomentosis, interstitiis vittarum postice elevatis, nitidis: corpore pedibusque olivaceo fuscis, abdomine tarsis tibiisque apice fulvis: capite fulvo-tomentoso vittis olivaceis: antennis nigris. *Long.*, 16 *mm.*

Minas Geraes.

PERMA SUTURALIS.

Minus elongata, olivaceo-fusca, thorace vitta dorsali elytris vittis suturali et intra-marginali griseis, antennis (scapo excepto) fulvo-testaceis: fronte elongata, carinata infra dilatata; tuberibus antenniferis longe distantibus, intus elevatis: thorace transversim rugoso: elytris cuneiformibus, punctatis, basi granulis nonnullis parvis: antennis articulis 1—5 *infra ciliatis.*

Long., 12—15 *mm.*

Possibly the *P. aulica* of Lacordaire, which, however, is described as having the abdomen red, and the antennæ (by implication) densely ciliated as in *Onocephala*. The name, in any case, cannot stand, as it was pre-occupied by Lucas for an apparently allied species.

Rio Janeiro.

PERMA CHALCOGRAMMA.

Fusca, fulvo-cinereo-pubescens, elytris lineis elevatis plurimis viridi-æneis nitidis, punctulatis; antennis (scapo excepto) livido-testaceis: capite et antennis ut in P. suturali: *tarsis fulvis.* *Long.*, 15 *mm.*

Rio Janeiro.

London: *May*, 1887.

Mamestra brassicæ feeding on oak.—In June, 1886, I found a batch of eggs on an oak leaf gathered from a tree about one mile distant from Birmingham. I reared the larvæ at first on oak, but when they grew a fair size their nature was plain to the eye, and I changed their food to hop as being more easily procured. This year (June, 1887) I reared a plentiful stock of *Mamestra brassicæ* from these oak eggs.—R. C. R. JORDAN, 105, Harborne Road, Edgbaston: *July* 16*th*, 1887.

Coriscium sulphurellum at Teignmouth.—I was at Teignmouth for a few days at the end of May, and on the 28th I caught *Coriscium sulphurellum* on a leaf of the smooth sallow in a sallow hedge; it looked quite at home there. I was very much puzzled at first by the moth, and, indeed, should have remained so, had I not found the following diagnosis in the *Tineina* volume of the "Insecta Britannica:" "Alis anticis dilute sulphureis, atomis numerosis sparsis fuscis, *interdum in maculas confluentibus*;" which was very distinctly the case in my specimen.—ID.

Migration of Insects.—The time has come for us (so it seems to me) to leave off theories on this subject, and to keep to facts; to record very carefully every observation bearing on the point, as well as on those wonderful sudden abundances of species which sometimes occur; every entomologist must have noticed such. Mr. Stainton did service by recording the swarms of *Lycæna Phlæas* which visited Lewisham a few years ago. I remember myself one season the hedge which lines the well-known drive to Mountsfield being nearly leafless from *Cheimatobia brumata.* This is specially mentioned, because the character of the female puts her beyond the faintest suspicion of any migration. About ten summers ago the hawthorn here was perfectly devastated by the larvæ of *Swammerdamia cæsiella*; it then became quite a scarce insect for a year or two. It seems to me a demonstrable fact, and one which may be laid down as a basis for observation, that every insect, rare or common, may become, from causes unknown at present to us, unusually abundant, quite independent of any migration. Let us, therefore, now no longer theorize, but observe and record facts, however trivial they may seem, bearing on the point; press the lighthouses into our service; and not suppose that migration explains everything. In fact, it explains nothing. There are not armies of *Aporia cratægi* waiting at Calais or Dieppe for a favourable wind to invade our coasts; if there were, their concerted action would be the real mystery: butterflies are not, like locusts, impelled by the devastation of their own swarms to move onwards. The cause is the true marvel!—Id.

Notes on Pancalia Latreillella and P. Leeuwenhoekella.—Mr. Stainton (Ent. Mo. Mag., xxi, p. 193) asked for the observations of entomologists on the above species. As no one has, I believe, since published any notes on them, and having recently taken the species in considerable plenty, the following notice may be of interest to your readers.

Guided by the Manual, and by reference to the Doubleday Collection, some six years ago, when I first captured *Pancalia Leeuwenhoekella*, I divided my series into two lots, one containing all the specimens with dark antennæ, the other the specimens with a white ring before the tip. The arrangement was purely artificial, as I took the form with dark antennæ at the same time and place as those with white ringed antennæ. The former I called *Latreillella*, the latter *Leeuwenhoekella.*

On Saturday last (June 4th) I took a fine series of this species on the Chalk Downs near Strood in Kent. The males were flying about soon after mid-day in the hot sunshine, and the females were running about over and among the grass, but I could see none deposit eggs. They seemed very restless, and took short jerky flights from one culm to the other, running frequently down among the lower part of the culms, whence it was not easy to get them to stir. I found two specimens on the dogwood (*Cornus sanguinea*) flowers.

Having got them home, I found I had captured altogether twenty-three specimens, of which *three* have dark fuscous unicolorous antennæ, *four* have the white ring just before the tip of the antennæ very faintly marked, and in one nearly obliterated, whilst the others have the white ring very distinct. The finest have a slight thickening just below the white ring of the antennæ, but I see no long scales there, although the thickening is distinct. The antennæ of these are very characteristic, being fuscous at the base, black in the centre (this is the thickened part), then a broad white ring followed by a fuscous tip. The ground colour of the insects varies considerably; some have the ground colour of a much lighter orange than others. I think this is more apparent than real, and due to the lighter insects being worn and having lost some of their scales. Herr Snellen's description (Ent. Mo. Mag., xxi, pp. 196, 197) is a first class one of my insects, but I find in my longer series one or two points worthy of notice. With regard to the pale silvery fascia near the base, twelve out of the twenty-three just captured have the fascia broken (as have others captured previously), and in six specimens the fascia is not continued beyond the break, extending only about one-third across the wing. The small spot on the inner margin is often absent, the caudal hook is as Herr Snellen says, very variable in position; in two of mine it is quite absent. The streak on the hind margin extends to the anal angle, and is much brighter in the female than in the males. I have one specimen perfectly unicolorous, with the exception of what Herr Snellen calls the fifth streak (on the costa). In fact, the size, number, position and shape of the spots is very inconstant.

There is a great deal of difference too in size. Some appear almost twice as large as others, those that have partially lost their fringes look *very stumpy*, but fine ones are sometimes very small.

It is certain that I have only one species, and that my species contains, I believe, undoubted specimens of *Leeuwenhoekella* and *Latreillella*, and probably *nodosella*. Some of the finest specimens in my series are without doubt the former, and unless this species sometimes has males with dark antennæ, those with dark antennæ must be the so-called *Latreillella*.

I have hardly ground for positively stating that I have anything referable to *nodosella* in my series, as I have not quite a distinct idea of the character of the thickening of the antennæ which occurs in this species. The finest *females* certainly have a slight thickening, and it must be remembered that all my insects were active when I captured them.

At any rate, I incline to Herr Snellen's opinion, so far as our own two species are concerned. Mr. Stainton's summary of Herr Snellen's opinion (Ent. Mo. Mag., xxi, 193) is that he "gets *nodosella* in Holland in company with *Latreillella*, of which he thinks it is the female, and that he thinks our *Leeuwenhoekella* consists only of worn specimens of *nodosella*, of which the thickening scales have vanished whilst actively on the wing."

I always take *Latreillella* with *Leeuwenhoekella*, and that there is much force in what Herr Snellen says with regard to the absence of the thickening scales, any one who has watched this active little species can readily believe. They scuttle rapidly about in the grass, and are so exceedingly active that there can be little doubt they soon get worn.

Some of my female specimens of *Leeuwenhoekella* are very fine, and, like the late Professor Zeller (Ent. Mo. Mag., xxi, 193), I also have perfect specimens of the female, which do not show any traces of the thickening on the antennæ so characteristic of *nodosella*. But although the insects may be fine, there seems no reason why a few scales on the antennæ should not be readily worn off as soon as the insect becomes active.

I have little doubt that Herr Snellen's view will turn out correct, and I have no doubt that, with a little more patience and care, I shall some day obtain a specimen that has not flown, which will prove his point.—J. W. Tutt, Rayleigh Villa, Westcombe Park, S.E.: *June*, 1887.

[I would ask the next captor of these moths, who is so fortunate as to meet with them in any quantity, to place a number of the living insects together in a glass-topped box, in hopes that thereby some may be induced to pair; those that pair should then be separated from the rest, and the specimens of which each pair consists should be specially labelled as ♂ and ♀, and as found *paired*, and we should thus soon ascertain whether those without any white ring on the antennæ were invariably females. If in some of the pairs both specimens were found to have white ringed antennæ, and in some of the pairs both specimens were found to have the antennæ entirely dark, we should, at any rate, have learnt something we do not at present know.—H. T. S.]

Note on Lühdorfia Puziloi, Ersch.—Last mail brought me Mr. H. J. Elwes' paper on the *Parnassiidæ* (Pro. Zoo. Soc., 19th Jan., 1886), and almost simultaneously I received from my collector a series of *Lühdorfia Puziloi* for which I have been searching for years. From Mr. Elwes' valuable paper, we now learn how the horny sheath on the body of females of the *Parnassiidæ* is formed, and why it is present in some specimens and absent in others, but we are, I think, as far off as ever from understanding the *use* of this very peculiar appendage. I believe Mr. Elwes has not had the opportunity of examining a female of *Lühdorfia Puziloi*, and it would appear that in all the other species he has dissected, the horny sheath is developed into a pouch which he supposes acts in some beneficial way in the sexual act; this, however, cannot be the explanation, as strangely enough, the sheath on *Lühdorfia* is nearly flat, and could not, I think, from its shape, act as an attachment in any way. This insect appears very early in the year; my first specimens were obtained on the 15th April, but it was then getting over, the males appear before the females, and it frequents wooded paths on the mountains, and is very easy to capture.—H. Pryer, Yokohama: *May 9th*, 1887.

A day's collecting (chiefly Diptera) at Esher.—On the 14th of this month (June) I collected for the first time this season, and chose Esher (Surrey) as my hunting ground. The day was very hot, and though I anticipated favourable results, I was scarcely prepared for the rich harvest that fell to my net. *Diptera*, as usual, formed the principal attraction, and these were found in great abundance. It is impossible to give a list of the species captured as so many of them are new to me, and no time has yet presented itself for their determination, which, considering the number of minute *Muscidæ* taken, will be a matter of very great difficulty. Speaking only approximately, I captured of the *Tipulidæ*, 12 species (60 specimens), *Empidæ*, 7 (20), *Bibionidæ*, 2 (10), *Mycetophilidæ*, 2 (6), *Dolichopodidæ*, 9 (106), *Syrphidæ*, 4 (6), *Muscinæ*, 4 (6), *Anthomyiinæ*, 30 (164), *Acalypterata*, 570 specimens; of these latter it is impossible to do more than estimate the number of species. Thus, of the *Diptera* alone, I captured about 70 species without the *Acalypterata*, which must comprise at the least 50 or 60 species. To mention some of the insects taken: among the *Muscinæ* were only four *Morellia hortorum*, one *Cyrtoneura*, and one *Lucilia*; among the *Anthomyiinæ*, *Cœnosia tigrina* was extremely abundant, the *var. leonina*, Rond., being also very common, of this species I took over 90 specimens. *Hylemyia strigosa* and *variata* were also common, I took with these species one *pullula* and some specimens of two species which appear to be *flavipennis* and *seticrura*, *Hyetodesia basalis*, and *populi*, *Polietes lardaria* and two or three undetermined species of *Phorbia* or *Chortophila* were all very common. The *Syrphidæ* were very poorly represented, only four species being taken, *Syritta pipiens*, *Platycheirus fulviventris* and *clypeatus*, and a *Chrysogaster* I have not determined. *Empis tessellata* was common in a hedge alongside a stream, and I took five or six species of *Hilara*, also two *Rhamphomyia nigripes*. One *Leptis tringaria* represented *Leptidæ*, and a dozen or so *Dilophus vulgaris* the *Bibionidæ*. *Dolichopodidæ* were rather abundant. The species I captured were *D. vitripennis*, 70 specimens, *pluvialis*, *festivus*, *confusus*, *signatus* and *æneus*, *Gymnopternus assimilis*, *Argyra diaphana*, and a very small species I have not yet recognised. The few *Acalypterata* I have had time to make out were *Scatophaga stercoraria*, 80, *merdaria*, 40 (these two species swarmed everywhere and were continually filling my net), *lutaria*, 3, *anilis*?, 1, and two or three of what appears to be another species I do not know. Two or three species of *Borborus* were very common (80 specimens), two species of *Tephritis* (6), three of *Chlorops* (6), a very small *Palloptera* or allied genus (20), and two or three species of *Lapromyza* (12), also a species which is labelled in the British Museum as *Heteromyza nervosa* (30), but which name I look upon with some suspicion, as Schiner, in his "Cat. Sys. Eur. Dip.," makes no mention of such a species. Altogether, I took about 950 *Diptera*, and the other orders are represented as follows, though it must be understood that I confined myself intentionally to the collecting of *Diptera*, and that the other insects were taken by chance whilst sweeping rushes and grass :—

Hymenoptera (66 specimens): *Andrenidæ* (2), *Nematus* (5 or 6), *Chrysididæ* (1), and the rest small *Ichneumonidæ*, which appeared tolerably common.

Coleoptera (90 specimens): *Notiophilus* (1), *Pæderus* (1), *Tachyporus hypnorum*, and 3 other species of *Staphylinidæ*, *Aphodius*, 2 species, *Telephorus*, 4 species, *Elateridæ*, 4 species (17 specimens), *Phyllobius argentatus* (6), *uniformis* (30), *pomonæ* (10), *Strophosomus coryli* (1), *Ceuthorhynchus* sp.? (11), *Apion* (1), and two other species of two genera of other *Curculionidæ* I do not know. One species of *Halticidæ* completes the list of beetles.

Hemiptera were scarce; and in the way of *Lepidoptera* I saw only a few *P. Phlæas* and one of the skippers and a species of *Tineina* flying over the furze.

A small *Orthopteron* and eight or ten spiders (which were most unpleasantly abundant, as they spun most annoyingly during their short sojourn in my net) bring the list to a close. In all, I took about 1050 specimens, not counting a 100 or so I threw away as being too damaged to preserve; of course many are too much broken for keeping as cabinet specimens, but will be valuable as recording the species of this locality. To any one who desires *Diptera*, *Coleoptera*, or *Hymenoptera*, I can confidently recommend Esher.—E. Brunetti, 129, Grosvenor Park, Camberwell: *June* 21*st*, 1887.

Earinus nitidulus, *Nees*.—Mr. Bridgman's note in the Magazine for this month, p. 15, leads me to say that I have a bred specimen of this species, which was determined for me in the year 1870 by the Rev. T. A. Marshall. Its cocoon agrees with Brischke's description, as quoted in the 1st part of Mr. Marshall's Monograph, and was dug at roots of a pear tree, near Worcester. Subsequent efforts to obtain more have been fruitless. I observed the omission of any reference to this specimen at the time the first part was issued, but deferred further notice of the subject in the hope of working up my *Braconidæ* as a whole.—J. E. FLETCHER, Worcester: *June*, 1887.

Odynerus reniformis, Gmel., at Chobham, Surrey.—On the 4th of this month I was collecting at Chobham, and was surprised to observe on a part of the common which I know particularly well, the curved tubes of an *Odynerus* projecting above the sandy soil. I waited by one of these for the return of its owner, and was pleased to find that it was the rare *O. reniformis.* I obtained three females, and could, no doubt, have taken more, as there were many tubes visible. I have collected a great deal at Chobham, especially in the exact locality above mentioned, but I have never before observed the tubes of this insect, and am very much inclined to think that it has taken up its abode there this year for the first time. This locality is about four miles from where Mr. Billups took it in 1884.—EDWARD SAUNDERS, St. Ann's, Bromley, Kent: *July 8th*, 1887.

Aspidiotus rapax, Comstock, in Europe (*Aspidiotus rapax*, Comstock, Rep. of Ent. of U. S. Dept. of Agr. for year 1880 [1881], pp. 307, 308, pl. xii, fig. 6).—On the leaf and flower bracts of camellia I have found in great numbers a species of *Aspidiotus* which, after microscopical examination, appeared to me to be identical with Professor Comstock's species, *A. rapax.* I therefore sent him some specimens for his opinion, and I append his answer. I thought at first that my specimens might prove to be the *A. camelliæ*, Boisduval, although they did not entirely agree with Dr. Signoret's description or figure (Ess. sur les Coch. [1868], p. 91, pl. iii, fig. 9), and I wrote to Mr. Douglas, asking him for a specimen of the *A. camelliæ*, which he mentions having been found in England (Ent. Mo. Mag., vol. xxii, p. 249). He kindly sent me several specimens, out of which I succeeded in making one suitable for microscopical examination, but this has proved to be identical with my own specimens, and therefore must be considered *A. rapax*, Comstock. Whether the *A. camelliæ*, Boisd., may ultimately prove to be identical with *A. rapax*, Coms., cannot at present be determined. To quote Mr. Douglas' own words:—

"As *A. camelliæ*, by description and figure, does not appear to be *exactly* the same as *A. rapax*, they must be kept separate, the difference being noted, until some lucky chance may clear the matter up."

Professor Comstock remarks in his letter:—"I think, without doubt, the specimens which you send belong to my species, *Aspidiotus rapax.* As to whether my *A. rapax* is a synonym of *A. camelliæ* I cannot express an opinion now. Boisduval's description is unrecognisable, and unless we can get typical specimens, it will be mere guess work to apply his name to any species. If there were only a single species of *Aspidiotus* that infested camellias, we would be reasonably certain that this was the one referred to; but I cannot see that anything is to be gained by throwing aside a specific name which is so fully defined that the species can be determined unquestionably from the description, for the sake of a name, the definition of which will apply to almost any species of this genus. Of course, if types of *A. camelliæ* are in existence, and they prove to be the same as *rapax*, the earlier name must stand. . . . . The only point is to be absolutely certain of the identity of the species before the name is changed."

We therefore may come to the conclusion, I think, that the *Aspidiotus rapax*, Comstock, which has hitherto been considered an American species, may now be recorded also as European, having been found both in England and Portugal.—Albert C. F. Morgan, Villa Nova da Gaya, Portugal: *July* 11*th*, 1887.

Coleoptera at Tonbridge.—Whilst Mr. W. G. Blatch was staying with me during the latter part of June, we explored this neighbourhood in search of *Coleoptera*. Sweeping was a comparative failure, and bark-work was also very unsuccessful as a whole, though a *Cossus*-infected oak produced a very few *Epuræa decempunctata*, and under beech bark in connection with a fungus growth was *Cicones variegatus*. A few *Xyletinus ater* and a number of *Tillus elongatus* were actively engaged on the trunks of pollard willows. Carrion produced only a few small *Homalotæ*, &c. Our best captures were in damp spots, dried-up ponds, and marshy localities. Here were *Anchomenus livens*, *Tachyporus formosus*, *Lathrobium punctatum*, &c. In one small spot, which I have designated "Blatch's hole" in honour of its discoverer, were several *Compsochilus palpalis*, *Acrognatha mandibularis*, *Homalota vilis* (abundantly), *H. difficilis*, *H. atrata*, *H. londinensis*, *Calodera rubens*, *Oxytelus fulvipes*, *Oxypoda lentula*, *Acupalpus consputus*, *Bryaxis sanguinea*, &c. One day spent at Hythe in search of *Dyschirius extensus* and *Philonthus astutus* produced hardly anything. Even *Polystichus vittatus* and *Trechus lapidosus* which I found fairly numerously three years ago were only represented by a single example of each.—A. C. Horner, Tonbridge: *July* 12*th*, 1887.

Note on Nothochrysa capitata, F., and Chrysopa tenella, Schnd.—A visit for a few days to the Rev. A. E. Eaton, at his Vicarage, Shepton Montague, near Wincanton, Somersetshire, resulted in the capture of a considerable number of *Chrysopidæ*. Two species are noteworthy. One ♀ *N. capitata* was taken at Stourton (Wilts.) on the 15th inst. Why this insect should continue so rare, both here and on the continent, I know not. This was the second time I had seen it alive; the first occasion being near Weybridge on July 5th, 1873 (*cf.*, Ent. Mo. Mag., x, p. 91). One ♂ and three ♀ of *Ch. tenella* occurred near Shepton Montague on the 13th. Of this I have probably not seen more than a dozen living examples during the last 25 years. Its size, and the pale yellow dorsal stripe when alive, render it liable to be passed by as only *Ch. vulgaris*. It is a very pretty species, but the pale dorsal stripe and the delicate green of the living insect soon vanish in dried examples. The other species captured were not important. All were beaten from ash, which is certainly one of the most productive trees for *Chrysopidæ*.—R. McLachlan, Lewisham, London: *July* 18*th*, 1887.

Note on four species of Ephemeridæ from Eastern Amurland.—A short time ago I received a small collection of *Neuroptera* taken by Herr Gräser in the eastern portion of the district through which the great river Amur flows. There are four species of *Ephemeridæ*, which I notice at the request of my friend the Rev. A. E. Eaton, in order that a reference may be given in the forthcoming concluding Part of his "Revisional Monograph." The materials are scanty, but allowing, in some cases, for slight colour-differences, which may possibly be due to local influences, all are, perhaps, referable to European forms.

Ephemera glaucops, Pict. One ♂ sub-imago from Nicolaijefk at the mouth of the Amur. Upon comparison with European specimens the identity seems certain; but I would remark that the markings of the abdomen are as prominent as is usually the case in the imago of European individuals, in which they are mostly obliterated or very faintly indicated in the sub-imago.

Siphlurus lacustris, Etn.?? One ♂ imago from Pokrofka on the Eastern Amur. The ventral U-shaped markings are nearly continuous on all the segments, which is not the case in the type-form, but occurs in specimens, possibly not *lacustris*, collected by Mr. Eaton in the Val Mazza, North Italy. But, supposing these latter to be distinct from *lacustris*, there are characters in the anal parts, &c., of the Amur ♂, that seem to differentiate it therefrom.

Heptagenia sulphurea, Müller. The ♂ imago from Nicolaijefk does not apparently differ from European individuals. A ♀ sub-imago from Chabarofka on the Amur is somewhat doubtful.

Heptagenia flava, Rostock. One ♀ imago, and three ♀ sub-imagos, do not apparently differ from European individuals; they also are from Nicolaijefk.

The *Ephemeridæ* of Eastern Siberia and Amurland, being hitherto practically unknown, I agree with Mr. Eaton that it is desirable to place these four species upon record.—Id.: *June*, 1887.

Obituary.

Pierre Millière died suddenly, in the 74th year of his age, on May 29th, at his residence at Cannes—we believe of *angina pectoris*. He had been in the enjoyment of his usual health till the previous day, when a sudden attack of illness caused him some uneasiness, but it speedily passed off, and no apprehension was entertained. A return of the malady on the 29th proved more serious, and in half an hour he was no more.

Of his early career we have no information. He joined the Entomological Society of France in 1851, and in the same year his first published note on an Entomological subject appeared in the "Bulletin" of that Society. This related to the experimental poisoning of two young sparrows by larvæ of *Deilephila euphorbiæ*, which had fed on *Euphorbia cyparissias*. At that time he was living at Lyon, which continued to be his residence for many years. In the Annales Soc. Ent. France, 1854, pp. 59—68, he gave a descriptive paper of several new *Micro-Lepidoptera*, some of which were taken on the summit of Mont Pilat near Lyon.

In April, 1855, he visited Hyères, where, in the stems of *Asphodelus ramosus*, which grows so abundantly in many parts of the Riviera, he met with the larvæ which furnished him with an interesting new *Tortrix*, *Hyerana* (Ann. Soc. Ent. France, 1857, p. 799, pl. 14, No. iii). In 1858 he collected at La Grande Chartreuse. Several weeks of the spring of 1859 and much of the following winter were spent at Hyères, and thenceforward, till he settled at Cannes, a large portion of each winter was passed in the South of France on the sunny shores of the Mediterranean. It was in 1858 that Millière commenced a series of Papers in the "Annales de la Société Linneénne de Lyon," under the title:—"Iconographie et Description de chenilles et Lépidoptères inédits." These continued to appear for well nigh twenty years, and constitute in their separate form three handsome 8vo volumes, each containing about 50 plates. In these papers Millière introduced many larvæ and perfect insects which he had received from Dr. Staudinger when in Spain, and a few that were sent to him by the late Henry Doubleday from Epping; but many of the species of which he treated in these papers were novelties discovered by himself in the South of France, together with larvæ of other species previously only known in the perfect state.

A mass of valuable notes have been given to the world in Millière's "Catalogue raisonné des Lépidoptères des Alpes Maritimes" (of which the third part, containing the *Micro-Lepidoptera*, appeared in 1875); a Supplement to this Catalogue appeared in 1886.

Several papers by Millière appeared in the "Annales de la Société des Sciences naturelles, Arts et Belles-lettres de Cannes" between 1875 and 1879; others in the "Naturalista Siciliano" of 1882, 1883, and 1886, &c., &c.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY: *June 23rd*, 1887: R. ADKIN, Esq., F.E.S., President, in the Chair.

Mr. Wellman exhibited bred specimens of *Lobophora viretata*, Hb., from Burton-on-Trent. Mr. Oldham, a number of species from Epping Forest, including *Drepana lacertinaria*, L., *D. falcataria*, L., *Notodonta dromedarius*, L., *Eurymene dolobraria*, L., and three specimens of *Chærocampa porcellus*, L. Mr. Jager, *Erastria venustula*, Hb., received from Horsham; bred examples of *Eupithecia isogrammaria*, H.-S., *E. tenuiata*, Hb., and *E. venosata*, Fb.; the last mentioned having been two years in pupa. Mr. W. A. Pearce, *Eupithecia isogrammaria*, H.-S., and *E. castigata*, Hb. Mr. Sheldon, bred examples of *Sesia culiciformis*, L. Dr. Rendall, *Heliaca tenebrata*, Scop., taken at Hounslow. Mr. Turner, living larvæ of *Cucullia verbasci*, L. Mr. West, of Greenwich, larvæ and cases of *Coleophora palliatella*, Zinck., and *C. currucipennella*, Fisch.

July 14th, 1887: The President in the Chair.

Dr. Rendall exhibited *Acidalia rubiginata*, Hufn., *A. marginepunctata*, Göze, *Eupithecia coronata*, Hb., *E. plumbeolata*, Haw., *Lithostege griseata*, Schiff., *Agrophila trabealis*, Scop., *Spilodes verticalis*, L., &c., all taken at Thetford. Mr. E. Joy, *Erastria venustula*, Hb., from Epping Forest. Mr. Wellman, *Dicranura furcula*, L., and *Eupithecia togata*, Hb., from Perth. Mr. Jager, *Dicranura bifida*, Hb., &c. Mr. J. T. Williams, *Heliothis dipsacea*, L., *Hydrelia uncula*, Clerck, from Suffolk. Mr. Tugwell, four varieties of the larvæ of *Cucullia chamomillæ*, Schiff., ranging from white to pink, *Sesia sphegiformis*, Fb., and *Dicranura bicuspis*, Bork. Mr. Hall, *Spilosoma mendica*, Clerck, bred from ova. Mr. Adkin, *Notodonta trepida*, Esp. (bred). Mr. Edwards, a variety of *Abraxas grossulariata*, L., the usual white ground colour being powdered over, giving it a deep grey appearance, the orange markings in the superior wings being very distinct. Mr. Baron exhibited a variety of *A. grossulariata*. Mr. South, some interesting forms of *Lycæna Icarus*, Rott., from the Isle of Wight, and called attention to a male with black spots on the hind-wings, which he had only previously seen on specimens from Sligo, Ireland.

Mr. Billups, *Xylocopa violacea*, L., and *X. latipes*, Drury, also *Taiscolia hæmorrhoidalis*, Fb., and read notes on his exhibit. Mr. Jenner Weir exhibited specimens of *Pieris oleracea*, Bois., from Hudson Bay, and *P. napi*, L., and contributed some interesting remarks. Mr. Billups stated that at West Ham the cabbages had been destroyed by the larvæ of *Pieris brassicæ*, L., but the cauliflowers were untouched.—H. W. BARKER, *Hon. Sec.*

ENTOMOLOGICAL SOCIETY OF LONDON: *July 6th*, 1887.—Dr. DAVID SHARP, F.Z.S., President, in the Chair.

The Rev. W. T. H. Newman, M.A., 11, Park Terrace, The Crescent, Oxford, was elected a Fellow of the Society.

Mr. McLachlan remarked that at the meeting of the Society in October, 1886, he exhibited a quantity of the so-called "jumping seeds" from Mexico, containing larvæ of *Carpocapsa saltitans*, Westw. The seeds had long ceased to "jump," which proved that the larvæ were either dead, had become quiescent, or had pupated; about a fortnight ago he opened one of the seeds, and found therein a living pupa. On the 4th inst. a moth (exhibited) was produced.

The President, on behalf of the Rev. H. S. Gorham, exhibited the following *Coleoptera*, lately taken in the New Forest:—*Anoplodera sexguttata*, Fab., wholly black variety; *Grammoptera analis*, Fab.; *Colydium elongatum*, Fab.; and a specimen of *Tachinus elongatus*, Gyll., with brownish-red elytra.

Mr. S. Stevens exhibited a specimen of *Orsodacna humeralis*, Latr. (*lineola*, Panz., var.), taken by him at Norwood: he also exhibited a specimen of the same beetle taken by him fifty years ago in Coombe Wood; during the interval he had never seen it alive.

Mr. G. T. Porritt exhibited, on behalf of Mr. N. F. Dobrée, of Beverley, a series of about thirty specimens of a *Tæniocampa* he had received from Hampshire, which had previously been referred to as a red form of *T. gracilis*. Mr. Dobrée was inclined to think they were not that species, but *T. stabilis*.

Mr. A. C. Horner exhibited the following species of *Coleoptera* from the neighbourhood of Tonbridge:—*Compsochilus palpalis*, Er. (5); *Acrognathus mandibularis*, Gyll. (4); *Homalota atrata*, Mann., *H. vilis*, Er., and *H. difficilis*, Bris.; *Calodera rubens*, Er.; and *Oxytelus fulvipes*, Er. He also exhibited a *Rhizophagus* from Sherwood Forest, which appeared to belong to a new species; and several specimens of *Holopedina polypori*, Först., also from Sherwood Forest, where he had found it in company with, and probably parasitic on, *Cis vestitus*.

Mr. Elisha exhibited two larvæ of *Zelleria hepariella*, Stn.

Mr. Stainton remarked that as the greater part of the larvæ of *Zelleria* were attached to the *Oleaceæ*, it seemed strange that certain species had been found on saxifrage.

Mr. Slater read a paper "On the presence of tannin in certain Insects, and its influence on their colours." He mentioned the facts that tannin was certainly present in the tissues of the leaf-, wood-, and bark-eating species, but not in the tissues of the carnivorous beetles, and that black colour on the elytra of certain beetles appeared to be produced by the action of iron on tannin. A discussion ensued, in which Prof. Meldola, Mr. Poulton, Dr. Sharp, and others took part.—W. W. FOWLER, *Hon. Sec.*

SUPPLEMENT TO ANNOTATED LIST OF BRITISH *ANTHOMYIIDÆ*.

BY R. H. MEADE.

(*Concluded from page* 58).

PEGOMYIA, R. Desv.

P. EPHIPPIUM, Zett., Schin.

In July last (1887), after the last part of this Supplement had been sent to press, I found three males of this species (which has not yet been recorded as British) at Baslow, near Chatsworth in Derbyshire. It bears a close resemblance to both *P. fulgens* and *P. vittigera*, but is decidedly distinct from either. The scales of the alulets are rather small, but unequal in size; therefore it must be placed in my first division of the second section of this genus.

The palpi are entirely yellow. The thorax is reddish-brown on the dorsum, covered with grey tomentum, and having the shoulders and sides, as well as the front edge, yellowish-white. The scutellum is yellow. The halteres and alulets are pale yellow. The abdomen is oblong, narrow and flat, brownish-yellow (testaceous) in colour, somewhat paler and translucent at the base, and becoming nigrescent towards the end. It is hairy, and furnished beneath the apex with large, black, globular genital appendages. The legs have the tarsi black, and there is also a black patch (Wisch) on the upper surfaces of the ends of the femora; all the rest of the limbs is pale yellow. This species differs from *P. fulgens* by having the alulets rather smaller, the palpi wholly yellow (without black tips), and the femora blackened on their upper extremities. It may be known from *P. vittigera* by its having the whole dorsum of the thorax grey, instead of its being only marked by a longitudinal grey stripe; and by the femora being blackened upon their upper ends, not surrounded near their apices with a black ring as in *P. vittigera*.

I do not know the female.

CARICEA, R. Desv.

C. EXSUL, Zett., and Schin.*

Both males and females of this fine species were sent to me last year by Miss R. Prescott Decie, of Bockleton Court, Tenbury. She had captured them in Devonshire. The antennæ and palpi are black. The arista is sub-plumose. The frontal space is much narrower in the male than the female, being about one-fourth of the width of the head in the former and more than a third in the latter sex. The face is rather prominent, and of a silvery-white colour, which extends up the sides of the frontal space, the middle of which is occupied by a bluish-grey stripe. The thorax and abdomen are clear ash-grey; the former is marked by two narrow longitudinal stripes placed near together, and has the shoulders and sides white. The abdomen is oblong and sub-cylindrical in the male, ovate and pointed in the female; it is marked on the back by four reddish-brown spots; the apex in the male is but little thickened, and the genitalia small. The legs are black, with the exception of the four posterior tibiæ in the male, which are testaceous, as well as the front knees and the points of the other femora. In the female the fore tibiæ are also brown. The tibiæ are surrounded at their extremities by a group of strong spines as in *C. tigrina*.

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* Schiner spells the name of this species *exul*, but I think that Zetterstedt is correct.

The alulets are large and milk-white. The wings have the external transverse veins oblique, and, as well as the internal ones, slightly clouded. The third and fourth longitudinal veins are parallel and curved backwards.

This fly seems very rare.

C. HUMILIS, Meig., Rond.

This pretty little species, which is about 3 mm. in length, has the male abdomen cylindrical, clubbed at the apex, and marked by six brown spots, as well as by a central row of small oblong marks. The antennæ and palpi are black; the arista is long and sub-plumose (Meigen says that it is bare, but the hairs are pale, very fine, and difficult to see); the legs are black, with the exception of the tibiæ and metatarsi, which are testaceous. The female closely resembles the male, except by the shape of the abdomen.

I found several specimens of this small fly at Buckingham in August, 1884.

C. SEXMACULATA, Meig.

This is also a well-marked little species, rather smaller than the last, which it closely resembles, the abdomen being marked in a similar manner; it differs from it, however, by having the legs wholly black, with the exception of the bases of the fore tibiæ, which are testaceous. The venation of the wings is also slightly different in the two species. Rondani has pointed out that in *C. humilis* the distance between the two transverse veins is equal to that of the external one from the point of the fifth longitudinal vein, and we find that in *C. sexmaculata* the external transverse vein is nearer to the end of the fifth longitudinal than to the internal transverse vein.

I found a single male in my garden near Bradford, on April 24th, 1886.

MACHORCHIS, Rond.

M. MEDITATA, Fall.

I captured a female of this rare species in my garden in July, 1886; previously I only knew the male. It closely resembles the female of *C. tigrina* in shape, size and markings, but differs by having a pubescent instead of a plumose arista, and by the abdomen being without the longitudinal central marks on the dorsum between the lateral spots, which are generally seen in *C. tigrina*.

CÆNOSIA, Meig.

C. SCRUPULOSA, Zett.
pacifica ?, Meig.

This species, of which the female only has been described, differs from *C. triangula*, Fall., by having the thorax marked only by one central longitudinal brown stripe instead of by three broad confluent ones, and by having the eyes placed nearer together. I captured two females at Buckingham, in August, 1884.

C. PICTIPENNIS, Lw., et Schin.
SAPROMYZA *costata* ?, Meig.
ORCHISIA *costata*, Rond.

Mr. Dale sent me two specimens of this curious little species (the generic position of which is rather obscure) captured (I believe) in Dorsetshire. It is characterized by the upper halves of the wings, with the exception of the tips, being nigrescent; the colour is very dark throughout the whole of the sub-marginal cells, and gradually becomes paler as it extends downwards, terminating in the lower edge of each discoidal cell. The lower portion of the wing and the tip are quite clear. The thorax is ash-grey; the abdomen of a yellowish or brownish-grey colour, sometimes marked with an indistinct dorsal stripe, and with two small round spots on each of the last two segments in the male, and upon all the segments in the female. The antennæ have the two basal joints yellow, and the third one black, with a sub-plumose arista.

C. GENICULATA, Fall.

I admitted this species into my list in 1883, though I had not then seen a British example. I captured one, however, in my garden near Bradford in June, 1886. It may be known from *C. sexnotata*, Meig., by the points of the hind femora being black.

CHIROSIA, Rond.

Gen. ch.—Eyes bare, remote in both sexes; arista pubescent; abdomen of male narrow and elongated with small sub-anal appendages; alulets with small equal-sized scales; wings having anal veins extended to the margin.

C. ALBITARSIS, Zett., Rond.

This pretty and peculiar little species, which Mr. Verrall has recorded as a native of Scotland, has the thorax brown with grey shoulders; the abdomen dark brownish-grey, hairy, and marked with an indistinct, longitudinal, black interrupted stripe. The wings are slightly brunescent; the legs in the male have the front tarsi longer than the tibiæ, and the three proximal joints more or less marked with white.

This genus was formed by Rondani for the reception of the above-mentioned species, and as this had not been recorded as an inhabitant of Great Britain at the time my "Annotated List of British *Anthomyiidæ*" was drawn up, I did not include it. In my analytical table of the genera with widely separated eyes in both sexes, which was published in the Ent. Mo. Mag., vol. xx, p. 50, the genus CHIROSIA should have had its place between MYCOPHAGA and CHELISIA.

CHELISIA, Rond.

C. TRICOLOR, Zett.

This small and rare species bears a close general resemblance to *C. mollicula*, Fall., so I have placed it in the same genus; it must, however, be looked upon as an aberrant species, for the male is destitute of the large and complicated genital processes seen in *C. mollicula*, which form one of the characteristic features of the genus.

C. tricolor has very short (almost rudimentary) anal veins, so I cannot put it into the last genus (*Chirosia*), though it would agree with its other characters. The antennæ are wholly black; the arista is pubescent; the thorax is grey, marked with two indistinct stripes; the abdomen has the first and second segments yellow, and the third and fourth grey, each segment being marked with two black spots. The division between the yellow and grey segments is sharply defined, by which it differs from *C. mollicula*, in which the hind segments, when nigrescent, are only partially and irregularly so.

I found a single male at Buckingham in August, 1884, and a single female (which is a good deal larger than the male) at Conishead Priory, near Ulverston, Lancashire, in August, 1886.

SCHÆNOMYZA, Hal.

S. LITORELLA, Fall.

Mr. W. H. Harris, of Cardiff, sent me a specimen of this little maritime fly in 1886, which he had found there. It may at once be known by its generic character of having the first longitudinal veins shortened, so that the internal transverse veins are placed considerably beyond the termination of the auxillary branches of the first longitudinal vein in the costa. The alulets are so small, that this species might more properly be left among the *Acalypteratæ*, where Meigen placed it in the genus *Sciomyza*.

Bradford: 1887.

A NEW SPECIES OF *ÆSCHNA* FROM SOUTH AMERICA.

BY ROBERT McLACHLAN, F.R.S., &c.

This belongs to the group of more or less reddish species in which the top of the front is *not* marked with a spot in the form of the letter T; a group of small extent.

ÆSCHNA PERRENSI, *n. sp.*

♂. Abdomen about 55 mm. Posterior-wing, 51 mm.

Wings long and rather narrow, sub-acute at apex, hyaline, with a faint yellow tinge at extreme base of posterior; but the costa, sub-costa, and median nervure as far as the pterostigma, and most of the chief sectors as far as the nodus (together with a portion of the basal network), are bright red, giving a reddish appearance to the basal and costal portion of the wings; neuration otherwise blackish-brown. 22—24 ante-cubital nervules and 11—13 post-cubital in anterior-wings; 14—15 ante- and post-cubital in posterior. Pterostigma very narrow (5½ mm.), yellow. Furcation of sub-nodal sector short and narrow, commencing below the middle of the pterostigma and enclosing only two rows of cellules. Discoidal triangle with three simple nervules in both pairs. Anal triangle in posterior with only one nervule. Membranule blackish-cinereous, short, not extending to the middle of the anal triangle.

Head and thorax reddish, with a slight olivaceous tinge, apparently without markings of any kind, but blackish about the ocelli, and the tips of the mandibles and the margin (? the whole) of the back of the eyes are black; thorax with cinereous pilosity above.

Abdomen somewhat slender, reddish above, dingy beneath; transverse sutures faintly blackish, but there are no evident markings in the dried individual, save that segments 3—5 appear to be somewhat yellowish at the oblique post-basal suture. Oreillets very small, triangular, and acute, the lower edge with black teeth. 10th segment nearly one-half shorter than the 9th, its margin rounded in front, only faint indications of carinæ.

Superior appendages about the length of the 9th and 10th segments united, in the form of long, narrow, lanceolate leaflets, narrower at the base, with a strong central longitudinal carina, sub-acute at apex; in the basal portion beneath (or internally), and on the margins are fine hair-bearing tubercles. Inferior appendage one-half shorter, long-triangular, its apex darker and slightly notched.

Legs: trochanters and femora red, tibiæ and tarsi black, but the tibiæ are blackish-piceous beneath; claws reddish, or reddish-piceous.

♀ unknown to me.

Hab.: Goya, Corrientes, Argentine Republic, 1 ♂ (slightly immature and somewhat crushed), collected by Mr. Perrens.

I believe this to be identical with *Æ. rufina*, from Minas Geraes, indicated by Hagen without description, and another quoted name is *erythroneura*, Selys, MS. I have a ♂ given to me by my friend Baron de Selys with no locality-label, but bearing a pencil-label (in my hand) "*rufinervis*," probably an error for *rufina*. It is slightly smaller than my type, and more adult, hence the pterostigma is darker, and the red portion of the neuration not so bright. I see no structural differences.

I dedicate the species to Mr. Perrens, who on several occasions has sent me extensive consignments of *Odonata*, &c., from Corrientes.

I here mention *Æ. variegata*, Fab., Syst. Ent. (and subsequent works), which may *possibly* belong to the same group, but certainly not to same species. It is indicated from Terra del Fuego, and is said to be in "Mus. Dom. Banks." In order to save disappointment, I state that it no longer exists in Mus. Banks, and has probably been long ago destroyed.

Lewisham, London: *June*, 1887.

BUTTERFLIES OCCURRING AT DOVER AND ITS VICINITY SINCE 1860.

BY C. G. HALL.

As our British butterflies appear to be getting scarcer, I have made the following notes with respect to those observed in this district:—

Gonepteryx rhamni.—Seen nearly every spring on fine days, but the prevalent north-easterly winds of late years have diminished its numbers; also occurs at harvest time.

Colias Edusa.—This is a true Dover insect, and occurs every year, and in certain valleys on the cliffs between Dover and Kingsdown commonly. Some years it is excessively abundant: take, for instance, 1877. The variety *Helice*, H., occasionally occurs. *C. Hyale.*—Much rarer than the preceding, and decidedly sporadic.

Aporia cratægi.—This elegant butterfly I took in 1862 and 1863 on the ground now covered by the Victoria Park; it never was very common, and I have not seen it since that date.

Pieris brassicæ and *rapæ.*—Always plentiful. *P. napi.*—rather local, most partial to the lanes inland. *P. Daplidice.*—Sporadic; Castle Hill, before the Park was made; I have never had the pleasure of taking it, but have seen it alive in the net.

Anthocharis cardamines. -This pretty species is abundant in the lanes towards Kearsney, Ewell, &c.

Leucophasia sinapis.—I have been told that it has been taken in some woods near Dover, but have no personal knowledge.

Arge Galathea.—Very abundant.

Pararge Ægeria.—Local, lanes inland, common. *P. Megæra*, same as preceding, but more abundant.

Epinephele Semele.—Very local, but abundant where it occurs; Coombe Wood, near Alkham, &c. *E. Janira*—Needs no comment. *E. Tithonus.*—near Canterbury. *E. Hyperanthus.*—Lanes, common; especially with *E. Semele* in Coombe Wood.

Cænonympha Pamphilus.—This insect seems to have the strongest constitution of all the butterflies, and baffles east winds, and is always to be seen from the bleak sand-hills at Deal to the shady nooks in the Warren at Folkestone.

Vanessa cardui.—Sporadic, but always occurs, though its appearance in spring after hibernation seems most general; very abundant in 1883. *V. Atalanta.*—Always common, inland and in gardens. *V. Io.*—Also common, but of very uncertain appearance. *V. polychloros.*—Rather scarce, but taken in spring at Sandwich: in the quaint little town it hibernates in the old churches and barns, and is seen in the streets; commoner than usual, 1883. *V. urticæ.*—Common everywhere.

Grapta C-album.—I used to take this butterfly at Dover in 1862—3: sometimes it occurred commonly, but I have never *seen* it since, nor have I heard of its capture.

Argynnis Aglaia.—Very common on the hills near Coombe Wood, Houghham, &c., but difficult to catch. *A. Lathonia.*—I took two at Walmer, 1875, and have seen several alive taken on Castle Hill and other localities in the neighbourhood; commoner some years than others. *A. Euphrosyne.*—lanes, in some localities common.

Melitæa Cinxia.—Apparently sporadic, very common about 1863, not observed to my knowledge since. *M. Artemis.*—Very local, but abundant in some marshy land between Deal and Sandwich.

I have never seen or heard of any captures of either *A. Paphia, Adippe*, or *Selene*, or *M. Athalia*, but it is possible they occur further inland.

Nemeobius Lucina.—Not very common and local.

Thecla quercus.—Woods, inland. *T. rubi.*—same as preceding, but much commoner; also in Folkestone Warren; very plentiful this year.

Chrysophanus Phlæas.—Of general occurrence, and the last butterfly to be seen on the approach of winter.

Polyommatus Argiolus.—Common amongst holly towards Ewell; very abundant in 1870. *P. Alsus.*—Very common everywhere. *P. Corydon.*—Always common on the chalk; sometimes it literally swarms. *P. Adonis.*—More local and not so plentiful; rather plentiful this year. *P. Ægon.*—Also common. *P. Agestis.*—A very common species; most plentiful, perhaps, on the sandhills at Deal.

Syrichthus malvæ.—Woods.

Thanaos Tages.—Very common.

Hesperia linea.—Also common. *H. sylvanus.*—The most common of the genus. *H. comma.*—Local; under the cliff near Kingsdown, and St. Margaret's Bay.

Other species *may* occur which have escaped my observation; and, in conclusion, I wish to say that the above notes are entirely with regard to *my* own experience.

Dover: *July 6th*, 1887.

OBSERVATIONS UPON *ASPIDIOTUS RAPAX*, COMSTOCK, AND *A. CAMELLIÆ* (BOISD.), SIGNORET: TWO ALLIED SPECIES OF *COCCIDÆ*.

BY ALBERT C. F. MORGAN, F.E.S.

I have already (p. 68, *ante*) on the one hand referred to the similarity which exists between the allied species of *A. rapax* and *A. camelliæ*, belonging to the sub-family of *Diaspinæ*, and on the other hand I have also quoted the opinions of competent authorities to the effect that we should not be justified in concluding that the two species are identical.

It may, perhaps, therefore, be convenient to bring before the reader the characteristic details of each species, in order that he may, without necessity of research, observe which are the characters common to both, and which are peculiarly distinctive of each species.

In order to do this, it will be well to recall Dr. Boisduval's* description of what he named *Kermes camelliæ.* It must be remembered that he divides the family† of *Coccidæ* into two genera only, viz., *Chermes* and *Cochinelles.* In the former he includes what are now classed as sub-families, *Diaspinæ* and *Lecaninæ*, and in the *Cochinelles* he includes the sub-family *Coccinæ.*

In his "Entomologie Horticole" (1867), p. 334, Boisduval writes thus:—

"Ce petit insecte est allongé, ovale, linéaire, un peu deprimé, d'un brun roux, souvent légèrement arqué, rappelant un peu par sa forme la *Kermés* coquille si commun sur certaines variétés de pommiers et poiriers. La larve, lorsquelle est débarassée de sa coque, est d'un vert un peu roussâtre.

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* Ess. sur l'Ent. Hort. (1867), p. 334.

† *op. cit.*, p. 301.

"Nous avons observé cet insecte sur le camellia, et une seule fois sur la Thé; il se tient, à la face supérieure des feuilles le long des nervures; on rencontre cependant quelquefois deux ou trois individus disseminés sur le limbe.

"Il ressemble par la couleur à celui des Hespérides; mais il est plus petit, et plus linéaire; il est plus adhérent, et on le détache facilement avec une petite brosse."

It would be difficult from this description to identify the species, and for this reason, perhaps, Prof. Targioni-Tozzetti, in his "Coccidarum Catalogus" (1868), does not mention it, except that on page 45, *op. cit*, in the genus *Mytilaspis*; and after giving the synonyms of *Mytilaspis linearis*, he remarks: –"An hic referendum: *Chermes camelliæ*, Boisd.?"

Signoret, however, definitely adopts Boisduval's specific name *camelliæ* for a species of *Aspidiotus* found on the camellia in the conservatories of the Luxembourg and the Bois du Boulogne, and he furnishes a description of the insect, together with a figure of the anal segment (An. Soc. Ent. France, 4° series, tom. ix, 1869, p. 117, and plate 3, fig. 9). His description is as follows:—

"Le bouclier est arrondi, très convexe, quelquefois noirâtre, ce qui est du à la fumagine dont l'arbrisseau se couvre assez souvent; autrement il est d'un brun jaunâtre plus on moins transparent. La coque femelle (*sic* ? mâle), est un peu plus allongée. La femelle est arrondie comme chez le *nerii*, mais d'une forme plus allongée et plus large postérieurement: elle en diffère par l'extrémité de l'abdomen n'offrant que deux lamelles visibles et quelques squames plus ou moins poilues; de plus, c'est à peine si l'on y voit des filières séparées, qui ne consistent qu'en un point operculaire avec un petit poil, et les plaques de filières manquent, du moins nous n'avons jamais pu les découvrir, malgré un grand nombre de préparations à la glycérine, à la potasse caustique, à l'eau, &c., et cependant nous opérions sur des femelles offrant un grand nombre d'œufs."

Here we have a detailed description, which, with its accompanying figure, should enable us to identify Signoret's species, but at present it does not seem to have been found in America, and I am not aware that it has ever been identified in Europe.

We will now turn to Professor Comstock's description of his species, *Aspidiotus rapax*. In the Agr. Report U. S. A., 1880, p. 307 he writes:

"The scale of the female is very convex, with the exuviæ between the centre and one side, and covered with secretion. The scale is grey, somewhat transparent, so that it appears yellowish when it covers a living female; the prominence which covers the exuviæ is dark brown or black, usually with a central dot and concentric ring, which are white. Ventral scale snowy-white, usually entire. * * *

* * * "The body of the female is nearly circular in outline, bright yellow in colour, with more or less translucent blotches. The last segment presents the following characters: the groups of spinnerets are wanting:

"Only one pair of well-developed lobes, the median, present. These are prominent. Each one is furnished with a notch on each side; the notch on the mesal margin is distad of that on the lateral margin. The second and third pair of lobes are represented by the minute pointed projections of the margin of the body.

"The margin of the ventral surface of the segment is deeply incised twice on each side of the meson; once laterad of the first lobe, and again between the rudimentary second and third lobes. The parts of the body-wall forming the margin of these incisions are conspicuously thickened.

"There are two simple tapering plates between the median lobes, two deeply and irregularly toothed or branched plates, extending caudad of each incision, one usually simple and tapering plate between the incisions of each side, and two or three of the same character laterad of the second incision.

"The first, second, and third pairs of spines of each surface are situated near the lateral bases of the first, second, and third lobes respectively; the fourth pair are situated at a little more than one-half the distance from the median lobes to the penultimate segment."

By a careful comparison of this description of *A. rapax* with Signoret's description of *A. camelliæ*, we observe that in each species the *scale* of the female is very convex, that it is more or less transparent, and that it is yellowish in its natural state when covering the body of the female insect.

The body of the female is circular, or nearly so, in each species, and the abdominal segment presents the following similar characters.

In each species there is only one pair of well-developed lobes, and on reference to Signoret's figure, we find these lobes are notched in the same manner as in Comstock's species.

On each side of the median lobes the margin is deeply incised twice in *A. rapax*, and Signoret's figure shows similar incisions, although he does not refer to them in his description. The two simple tapering plates between the median lobes of *A. rapax* are also shown in Signoret's figure of *A. camelliæ*; and, lastly, the groups of spinnerets are wanting in both species.

Therefore, the points of similarity between the two species consist—

(i.) In similar appearance of scale.

(ii.) One pair only of well-developed lobes.

(iii.) Two deep incisions in margin of anal segment, laterad of each median lobe.

(iv.) Two simple plates between the median lobes.

(v.) Absence of groups of spinnerets.

The characters, however, which are dissimilar in the two species are not less important than those which are common to both.

On reference to Signoret's figure, we find three spines or hairs close to the margin of the abdominal segment, just above the base of each median lobe, which are not mentioned or figured by Comstock, nor have I found them in any of the individuals which I have examined of the European *A. rapax*.

Signoret also gives five similar spines arranged transversely on the dextral side of the anus, and three similarly arranged on the sinistral side. These are not to be found in *A. rapax*.

Again, in Signoret's figure the median lobes, although showing similar and similarly situated notches to those of *A. rapax*, are not quite of the same shape. Those of *A. camelliæ* appear to be of a considerably longer form than those of *A. rapax*.

It would not, perhaps, be prudent to attach much importance to any difference which may appear to exist between the anal plates, as drawn in Signoret's figure, and those of *A. rapax*, as I do not think that Dr. Signoret makes these play so important a part in characterising species, as Prof. Comstock has more recently shown to be necessary.

There is yet one more, and as I think an important, point of difference between the two species. *A. rapax* has an entire ventral scale, that is to say, if the insect is turned over, it will be found completely enveloped in its scale, both ventrally and dorsally, which does not occur in some species; for instance, *A. nerii*, which has a mere white film ventrally, and this remains on the leaf when the insect is removed. It can scarcely be supposed that such a character would have been overlooked by so distinguished an entomologist as Dr. Signoret; on the contrary, we find that he observed this character in *one* species under his examination, and he considered it of sufficient importance to establish a new genus, which he named *Targionia*, in order to include this one species with an entire ventral scale (See Ess. sur les Coch., 1870, pp. 105, 106, *vel.* Cocc., p. 149). This genus has since been abolished by Prof. Comstock, for reasons which he gives in his Sec. Rep., 1883, p. 82. The absence, therefore, of any record by Signoret of a ventral scale in his *A. camelliæ* must, I think, be considered important.

Of course, as is well known, the difference in many of the species, and especially in those which are closely allied, of the genus *Aspidiotus* is slight, and only to be observed by microscopical examination. But as the anal plates of the insect may, perhaps, not unreasonably be supposed to assist the insect in weaving its scale, it may not be improbable that the difference in the appearance of the scales, which is observed in different species, otherwise very similar, may be caused by the differentiated form and number of the marginal plates.

Villa Nova da Gaya, Portugal:
July 28th, 1887.

MESOSA NUBILA IN HUNTINGDONSHIRE.

BY J. BROWN, F.E.S.

The scattered woods of Huntingdonshire, if taken together, occupy at the present time a considerable area of the county, and, doubtless, these woods at one period were united, and so formed one vast forest, which for many miles extended close to, and partly surrounded, the great Fen containing the large Meres, known as "Whittlesea," "Ugg," and "Ramsay;" to enumerate the natural productions of these Fens would occupy too great a space, I will, therefore, leave that for a future paper.

Notwithstanding the annual clearances in these woods, Monk's Wood remains still the largest, other small woods extend north-east towards Ramsay, and north-west to, and across the great north road running into the adjoining county, Northamptonshire.

Formerly bordering these woods were large grass meadows, where, in the middle of June to July, might be seen many specimens of *Aporia cratægi* with wavy flight settling upon flowers; these meadows were also studded with large hawthorns, from the blossoms of which, at the end of May, numbers of the thick-kneed beetle *Osphya bipunctata* might be taken.

All these woods contain *Mesosa nubila.* The wood I visited (17th of April) for this Longicorn beetle was near Ramsay, the oaks in which were very old, some felling was going on, the woodcutters informed me that no oaks had been taken down for fifty years; on splitting decayed pieces from these trees, I found many perfect specimens of *M. nubila* and its larvæ in all stages under the bark; and perfect specimens of *Elater sanguineus* and many of the same from other pieces blown down by high winds in winter.

This wood, and the others previously mentioned, are open, and free of access to the people of the villages, and an enormous quantity of pieces containing these beetles are collected and broken up for firewood; sometimes the ground within these woods is covered with oak branches, whose vitality has been destroyed chiefly by the ravages of the larvæ of *M. nubila** and other beetles.

Any Coleopterist desirous of obtaining specimens would be well repaid by a visit to this locality.

The pieces of oak containing the larvæ, pupæ, or imago, although upon the ground, continue to supply nourishment; on examination of these pieces by splitting them, you may trace the galleries made by these larvæ, you may find many in various stages of development, and, by comparison, we may safely assume three or four years the maximum time to attain to pupa and perfect state.

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* Here we venture to differ from our correspondent, believing that *most* of the beetles only stepped in because the vitality of the trees had been impaired from other causes.—Eds.

The larvæ are soft, fleshy, and of a light drab colour, with a small black spot upon each segment, six small feet, and the head dark brown; to assist them in their work of feeding, they have upon each segment a tubercle that helps them to press against the side of the gallery within which they are feeding; these galleries diverge in various directions towards the outer edge of the solid wood, and towards autumn those larvæ that are full-fed have approached close to the bark, and make for themselves a chamber, change to pupæ, and remain in that state about three weeks, and then assume the perfect condition.

5, King's Parade, Cambridge:
August, 1887.

[Mr. Brown has sent us a portion of a much decayed oak branch, showing the larval gallery and the pupal chamber, in which is the perfect insect.—Eds.]

The great abundance of the Cabbage-White Butterflies (*Pieris brassicæ and rapæ*) *in England in July and August*, 1887.—This has become so notorious to every observer that we take it to be useless to insert special notices of the phœnomenon. To some of us it requires the memory to be taxed to the extent of nearly 40 years in order to realize a parallel. And the extreme abundance of *P. brassicæ* is quite on a par with that of *P. rapæ*. *P. napi* we do not specially allude to, but its numbers seem to have been far greater than is usual.

The cold and comparatively dry winter, and the hot summer, have no doubt had some influence; but in regarding individuals of both *P. brassicæ* and *P. rapæ*, a very considerable proportion of the whole are in a battered condition. This might be due to the pugnacious instincts of the butterflies; but there were no indications last year to lead us to anticipate an abundance such as the present. We think it most probable that extensive immigration has taken place, and possibly in a nearly continuous manner, the heat, absence of high winds, and even the drought, seem to have been especially favourable for migration in these species, for the records of their migrations almost invariably allude to them as occurring in calm hot weather with a smooth sea. The effect on our crops of coleworts is much dreaded by some. At present we prefer to regard it as an unknown quantity. Analogous superabundances have often left only the most transient traces of their effects.

But if we do not think it necessary to insert special notices on the subject of the present abundance for the South of England, and even for the Midlands (for we learn that the insects are equally abundant there), we shall be glad to have records of a *negative* nature for the South, and *positive* information as to how far north in these islands the phœnomenon has extended; and also, generally, for Ireland. It is an extremely interesting subject, and one that has several bearings.—Editors: London, *August*, 1887.

Probable immigration of White Butterflies.—I went over to Hunstanton one day towards the end of May when the white butterflies were coming out. The day was bright and sunny, but the wind, what there was of it, from the N.E. and cold. On the way *Pieris rapæ*, with doubtless *napi*, was common, but not more than a casual specimen or two of *P. brassicæ* was to be seen. But on reaching Hunstanton and in walking along the top of the cliff to Old Hunstanton, I came upon multitudes of the latter species, more I think than I ever before saw together. They were flying about the level ground on the top of the cliff, and settling in dozens on the flowers, but did not seem to be in any such numbers further inland, and as no field of any plant of the cabbage or turnip class was visible, nor any probable food plant, I concluded (and still think) that I had come upon a flight of immigrants immediately after their arrival, and before they had recovered sufficiently to pass inland. The great majority were *Pieris brassicæ*, but *P. rapæ* was also numerous. I did not notice *P. napi*. These butterflies seem to have taken very nearly the course of so large a proportion of our migratory birds.—CHAS. G. BARRETT, King's Lynn: *August* 18*th*, 1887.

Migration of Insects.—As far as change of abode (wandering or migration in the more limited application of that term) is concerned, many instances are known to entomologists in this country. For example, *Melitæa Athalia* is well known to change its breeding ground from time to time. Again, *Ino statices* frequently changes its head quarters. It may be only from one field into another adjacent thereto; but in one case which came under my observation, a colony had removed from a certain field to another field half a mile distant.

Perhaps no one will deny that certain species of moths and butterflies are migratory to the extent of changing their breeding ground either annually or every few years; but as regards immigration of insects into this country, entomologists are divided in opinion. The facts bearing on immigration are less convincing than those just adverted to, which point to simple migration, and it must be admitted that we have no positive proof that foreign-born insects ever do arrive in Britain by what may be called the direct air line route. I feel assured, however, that when British entomologists, in conjunction with their *confrères* abroad, set about investigating the matter in a thoroughly practical manner, it will be found that not only do many species of *Lepidoptera* migrate considerable distances, but that several species we little suspect of being other than pure British subjects, are in reality only aliens or the descendants of aliens.

We have records of clouds and swarms of butterflies and lesser numbers down to single individuals of moths observed over the land and far out at sea; sometimes the flight has been at a considerable elevation, and in other instances quite low. I think we can hardly question the value of these records as a whole, even if in one or two the accuracy of detail may be doubtful. They appear to establish as a fact that there are species of *Lepidoptera* which leave the place of their birth and travel far from there.

That a host of any species of butterfly should lie on the north coast of France waiting for a favourable moment to invade England, I think no one will suppose probable; but from a point very considerably farther to the south or east, a swarm of butterflies, ay, or moths either, might ascend higher and higher into the air until they reached a current which would waft some of them to these shores; the majority would probably fall over part of Central and North-West Europe, and many perhaps into the sea.

Dr. Jordan says (*ante* p. 64) that "butterflies are not, like locusts, impelled by the devastations of their own swarms to move onwards." In this he is right up to a certain point; but may there not be in butterflies and moths an instinctive something which urges them to seek "fresh woods and pastures new" for their progeny? In a former note on this subject (Ent. Mo. Mag., vol. xxi, p. 208), I suggested that the migratory instinct of a species of *Lepidoptera* addicted to wandering is excited or suppressed by meteorological influence. This view I still entertain. I would ask, is it not probable, that if in certain seasons the weather should be of a character favourable to the welfare of a particular species of the *Rhopalocera*, for example, and the species should attain the perfect state in exceeding abundance—is it not probable, I say, under such circumstances, that the insect may, having a care for the future of its race, be actuated to leave the place of its birth and endeavour to establish itself in some distant locality? With this object in view, what better plan could the insect adopt than that of soaring aloft and suffering itself to be air-borne to its new home? There are certain objections to such a theory, but, as far as I can see, none which are fatal if migratory instinct is admitted as a first principle.—Richard South, 12, Abbey Gardens, St. John's Wood, N.W.: *August 9th*, 1887.

Small birds and the Lepidoptera eaten by them.—Twice I can clearly remember seeing a swallow snap up a tolerably large moth—once it was, I believe, a *Cidaria russata*, and last year, in Jersey, one carried off an *Alcis*? I was chasing, before my very nose! I have often seen the robin with *Noctuæ*, and the common sparrow also, frequently have I seen the latter chasing yellow-underwings; from the greater titmouse, I one day took a *Triphæna fimbria* in sadly battered condition. I have seen the common flycatcher take butterflies more than once. I can well remember how gracefully one swept from the bough of a chestnut and caught a *Lasiommata Ægeria* in its flight, then curving round returned to its perch again. The other day, however, I saw one serve a *Tortrix* larva in the same way, it was suspended from a beech tree by a silken thread and was eaten like a fly. I did not previously know they would eat larvæ.—R. C. R. Jordan, 105, Harborne Road, Edgbaston, Birmingham, *July 17th*, 1887.

Harma Hecatæa, Hewitson.—Having occasion to look at the drawer containing Mr. Hewitson's specimens of *Harma*, my attention was suddenly arrested by seeing the albino form of *Lachnoptera Laodice* under the name of *H. Hecatæa*. How Hewitson could have made so grievous a slip it is hard to understand.—A. G. Butler, British Museum, Cromwell Road, S.W.: *August 5th*, 1887.

Note on Pyrausta punicealis.—I former years I used to associate this little Pyrale with chalk-downs and the like. During this month (and the end of the last) it has been common in my garden here, frequenting a small patch of *mint* less than a yard square. At times, more than a dozen could be seen at the same moment. I have never before seen it here. In 1886 the mint was luxuriant; this year, owing to the drought, it has barely sufficed for current kitchen requirements, and I have neither seen, nor heard of any indications of larvæ on it.* Possibly the occurrence is to be put in the "sporadic" category, an unsatisfactory explanation, but it defines certain conditions that exist in many insects, and which obtain especially amongst Pyralides.

In the "Manual" *marjoram* is given as the food-plant of *P. punicealis*. Mr. Stainton provides me with the information that Bouché bred it from species of *Mentha*; Rössler found the larva gregarious on *Mentha aquatica*; Schleich on the same plant; Büttner found it on *Thymus*; and Harwood on *Nepeta cataria* (*cf.* Ent. Mo. Mag., xi, p. 66). Thus there is nothing very remarkable save its sudden appearance in numbers in a small London garden where it had never before been observed; and I may venture the remark that the Entomology of my garden is tolerably familiar to me, and that unusual occurrences are at once noticed. *This* year there have been several unusual occurrences in addition to the above.—R. McLachlan, Lewisham: *August* 11*th*, 1887.

Larva in swollen knots on the stems and branches of Juniper.—Mr. Stainton, in his notice of *Lobesia permixtana* (Ent. Mo. Mag., xxiv, p. 58), mentions (p. 60) that Herr Hartmann had observed a larva in the swollen knots on the stems and branches of *Juniperus communis*, which he regarded as that of *L. permixtana*. It seems to me, however, extremely probable that the larva here referred to must have been that of *Grapholitha opulentana*, Millière.

I am not aware that the latter feeds on *Juniperus communis*, but I have frequently bred it from swollen knots on *Juniperus oxycedrus*.

The species is not uncommon at Cannes, and is described and figured in the Annales de la Société Entomologique de Belgique, vol. xx, p. 62, pl. 1, fig. 9—11 (1877). I found it before our late friend Millière had published his description, and until I showed it to him, I was not aware that he had already met with it.

The figure in the plate does not give a true idea of the way in which the larva feeds. It mines in and under the bark on the swollen stems, but does not make a hollow in the centre of the stem itself; the figure gives one too much the idea of an empty gall.

I am informed by Monsieur Constant that the larva actually feeds upon a small fungus, with which these small gall-like swellings are almost invariably studded. The moth might almost be said to bear a superficial resemblance to the female of *Lobesia permixtana*.—Walsingham, Merton Hall, Thetford: *August* 2*nd*, 1887.

[Millière mentions in a note that the galls on the stems of *Juniperus oxycedrus* are probably the work of a Dipteron, he having repeatedly found Dipterous larvæ in these gall-like swellings before there was any symptom of the Lepidopterous larva. Unfortunately he had not succeeded, at the time he wrote this note, in ascertaining to what these Dipterous larvæ turned. His notion was that the ♀ *opulentana* only deposited her eggs on those branches which had been already attacked by the Dipterous insect. Have we here a case of companion-larvæ?—H. T. S.]

Notes on Tortrices, &c., in Kent in 1887.—Mr. Stainton's note in the last number of the Magazine on *Lobesia reliquana* reminds me how overlooked some of our commonest *Tortrices* seem to be. *L. reliquana* in this district is an abundant insect, and flies in the late afternoon and early evening at the end of May and beginning of June, over the tops of the oak bushes and small trees. I can hardly think it feeds on golden-rod, for it is very common even in woods where the plant is entirely absent, and in collecting the stems and seed-heads for the purpose of rearing the *Eupitheciæ*, *Eupœciliæ*, &c., &c., I never heard of any one breeding *reliquana*. It is, in my experience, confined to oak only.

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* The larvæ are common now, August 22nd.—R. McL.

Tortrices have been more frequent than usual, and in consequence of the hot weather their duration was short. *S. obscurana*, which I fancy is one of the most overlooked of our metropolitan species, was very common in June; it flies freely round the tips of the higher branches of oak trees in woods from 5 to 7.30 p.m. *A. upupana* was commoner than usual, but nearly a fortnight late in appearance, a remark that applies to many other species, such as *T. Branderiana*, *E. puncticostana*, *C. juliana*, *H. minutana*, *aceriana*, *C. grossana*, *S. achatana*, *D. sequana*, &c., &c.

Double broods, evidently caused by the season, are now appearing in some few instances, of which *A. derasana* is the latest I have observed. The autumn species are in great force now, and I have never seen *H. nigromaculana* or *E. dubitana* in such abundance, especially the latter; *S. spiniana* is just appearing, and is as great a puzzle as ever, although undoubtedly attached to hawthorn, how or when it feeds is a problem awaiting solution.

Respecting *Macro-Lepidoptera*, light has proved wonderfully attractive during the summer. On one evening, between 11 p.m. and 1.30 a.m., no less than forty-one species came into my room attracted by the lamp. There have been a few curious visitors, such as *A. luctuosa*, *P. bajularia*, *E. fraxinata*, *S. cinctalis*, &c., while *A. porphyrea* and *P. tersata* must have come very far, there being no heather or *Clematis vitalba* in the neighbourhood. Second appearances are of course frequent. I have noticed during the last week *S. populi*, and have bred a number of *N. dromedarius*, and the *third* brood of *A. subsericeata* is now coming out in my cages.—C. Fenn, Eversden House, Burnt Ash Hill, Lee, Kent: *August* 18*th*, 1887.

Description of the larva of Eupœcilia flaviciliana.—In a valley among the downs near Sanderstead, where I had the previous season found *flaviciliana* flying at dusk, last July I observed a ♀ depositing her eggs in the flowers of *Knautia arvensis*. By collecting the flower-heads in the course of the following month the larvæ were obtained in some numbers, and though I failed myself, both Mr. Bird and Mr. Fletcher have succeeded this year in rearing the imago. The young larvæ, which at first are dark blackish-brown with black head, live in the florets, several often in a single head. As the seed-vessels develope, the larvæ attack them, eating out the inside and passing from one to another. The full-fed larva is plump but active, of varying colour, sometimes wholly dull green, or green with more or less of a pinkish tinge, or, lastly, entirely reddish-brown; the head and plates brown. They may be found within the receptacle, or on its outside, protected by several seed vessels spun together; but as the season advances, they are probably all alike blown down to the ground, where they spin up among rubbish. In confinement (in the linen bag in which they were being reared) they spun dirty grey cocoons among the folds, in which they passed the winter. In several instances I found larvæ which had come to an untimely end in an unexpected way. Having eaten out the contents of one seed, the inmate had bored a lateral hole of egress, and another into the adjoining seed vessel. With its head in the fresh seed, and its tail not yet out of the empty one, the walls of the seeds would seem to have suddenly contracted, perhaps under the influence of the sun's heat, and pinned the unfortunate emigrant in such a way that he could neither advance or recede. The larvæ may be found through August and September, and even into October. The perfect insect emerges in July. —W. Warren, Merton Cottage, Cambridge: *August* 19*th*, 1887.

Description of the larva of Stigmonota pallifrontana, Z.—Having found the imago of this species not uncommon, flitting about a few bushes of the *Astragalus glycyphyllos* in July, I was able in August to detect and collect the larvæ in plenty. These, when young, are pale whitish-green, with black-brown head and thoracic plate. At this period they appear to feed between the two valves of the pod, or on the soft inside of a pod; attacking the seeds themselves only as they advance in size. After clearing out the seeds of one pod they move on to another. Their presence within is betrayed by a slight discoloration near the base. This is easily discernible when the pods are green: but when, as often happens if exposed to the sun, they become purplish, the action of the larvæ inside is not so manifest. In many cases also, where the larva has attacked only the seeds without touching the inner tissue of the pod, no trace whatever exists externally, whereby its presence may be conjectured. Inasmuch as the vetch goes on flowering upwards through the latter part of June and the whole of July, the earliest pods are formed lowest down the stem, and in these larvæ produced from the eggs laid by the early ♀s may be found, while there are still flowers at the top of the branch, and later imagines depositing their eggs thereon. When full-fed, the larvæ are dull yellowish-green, with pale brown head, dirty brown thoracic plate, with its edges darker margined, and dull brown, small plate on the anal segment, spots small, brown, but distinct. At the very last a remarkable change occurs: the whole body turns a most brilliant red, clearly visible through the husk of the pod. The larvæ then eat their way out, to spin up in a convenient receptacle. I find that in confinement they take very kindly to virgin cork, into the interstices of which they at once retire and spin their cocoons.

The perfect insects fly in the afternoon from 2 to 6 o'clock; the males, which are extremely difficult to detect on the wing, buzzing vigorously in the air in the vicinity of the food-plant, while the females hover gently round the whorls of flowers, or rest on leaves near them. Although the insect has been hitherto a rarity in this country, I think I can safely predict, judging from my experience of it this season, that it will shortly be found abundant wherever its food plant occurs.—Id.

Food-plant of Eupœcilia pallidana, Z.—Having, in June, 1886, found a nice locality for this species on a dry sloping bank facing the sea, I revisited the place on the last day of July following, intent on finding the larva. I had no very definite idea what plants I ought to examine as the moths seemed to discard all flowers, but were very fond of settling on the fronds of the bracken. Having arrived at the stile overlooking the bank, I was debating with myself what plant to begin on when my eye fell on a fine bunch of *Jasione montana* which was just going out of bloom;

needless to say that I at once pounced upon a seedhead, on opening which a fine fat reddish *Eupœcilia* larva bustled out in great haste. Subsequent examination revealed larvæ of all sizes in these seedheads from the full-fed stage to mere babies, one head often containing several larvæ in various stages of growth. Owing to an accident my own batch came to grief, but Messrs. E. R. Bankes and W. H. B. Fletcher have been more successful, and have dúly bred several specimens of *Eupœcilia pallidana* from these larvæ this year, the imago emerging in June.—C. R. Digby, Studland Rectory: *August* 5*th*, 1887.

The true position of the genus Chimarrha.—When making a critical examination of the pretty *Chimarrha marginata*, L., for my Revision and Synopsis of the European *Trichoptera*, certain points in its structure induced me to hold grave doubts as to the correctness of its position in the family *Rhyacophilidæ* in which it had been placed by Trichopterists, and in which I retained it provisionally. Dr. Fritz Müller has just published (Entomologische Nachrichten, xiii, No. 15, Aug., 1887) notes on a Brazilian species of *Chimarrha* which tend to prove that the genus should really be placed in the *Hydropsychidæ*, which accords with my own idea suggested in 1879. He found *a pupa* in a fixed case of small stones attached to a larger stone, and bred therefrom a *Chimarrha*. He urges that the case belonged to the *Hydropsychidæ* because its fixed side was closed by a web which is absent in the otherwise very similar cases of *Rhyacophilidæ*, and, as I read his remarks, there was no special inner pupal cocoon* (which exists in *Rhyacophilidæ*). For some other interesting details I refer the reader to Dr. Müller's original remarks. He offers no opinion on the condition of the terminal joint of the maxillary palpi, which, in the *Hydropsychidæ*, is multi-articulate, or, at any rate, with a semblance of being formed of more or less numerous small joints, a point on which I could not satisfy myself in 1879, so far as *Chimarrha* was concerned. But I think we may now assume that the genus belongs to the *Hydropsychidæ*, a change that will not alter its sequential position in my European arrangement, where it immediately follows that family, heading the *Rhyacophilidæ* as a special "Section." As *Ch. marginata* is usually very abundant where it occurs, there should be no difficulty in finding its larva, and Dr. Müller's remarks furnish a clue.—R. McLachlan, Lewisham: *August* 6*th*, 1887.

Concerning Tæniopteryx maracandica, McLach.—Having been attempting to-day to effect a provisional re-arrangement of some of my smaller *Perlidæ* of the European Fauna, which had fallen into a chaotic condition, and being occupied with the genus *Tæniopteryx*, I had occasion to re-examine *T. maracandica*, McLach., from Turkestan, described (and wing figured) in the *Neuroptera* of Fedtschenko's Travels in Turkestan, p. 34, pl. iv. (1875). The insect resembles a *Tæniopteryx* in its elongate form, and even the neuration is not distinctly opposed to its position in that genus; but I find the second joint of the tarsi is *very short*, and as Pictet makes this one of the essential characters in separating *Tæniopteryx* (in which all three joints are long) from *Nemoura* (in which the middle joint is very short), I think it will be better to transfer *T. maracandica* to the genus *Nemoura*. On parallel grounds Pictet retains *monilicornis* (not personally known to me) in *Tæniopteryx*, although its neuration (as figured) does dot appear to differ from that of *Leuctra*.—Id.: *August* 1*st*, 1887.

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* As distinct from the pupal integument.—R. McL.

The electric light as an attraction for Trichoptera.—Whilst waiting for the midnight train west, I pencil you a line. This place is a paradise for the Neuropterist. *Ephemeridæ* of four or five species abound, some very large, and *Trichoptera* are in thousands. At Niagara Falls Station the *Trichoptera* come to the electric light, and in one glass there is a layer of them at least an inch thick at the bottom, they having been killed by flying at the light.—T. D. A. COCKERELL, Buffalo Station: *July 7th*, 1887.

[Compare my notes in Ent. Mo. Mag., xxi, p. 91, September, 1884.—R. McL.]

Swarms of Lasius niger, L., var. alienus, Först., near Dover.—This race or variety of *L. niger*, which was at one time separated as a species (Först., Hym. Stud., Heft. 1. *Formicariæ*: and Cat. Hymen. Aculeata, F. Smith, Ent. Soc., Lon., 1871), was in the most extraordinary abundance at Buckland, near Dover, on August 7th. Being a still and sultry evening, the air was literally full of males, and the ground and walls covered by myriads of both sexes; the females had mostly denuded themselves of their wings in order to seek a suitable place for oviposition. I have seen this species in great abundance on the sandhills at Deal in certain seasons, but never anything to compare to the countless thousands on that evening. The late Mr. F. Smith (Ent. Ann., 1856, p. 94) describes an extraordinary flight of Ants at Dover, but this species was augmented by *Myrmica scabrinodis* and *lævinodis*, which I did not observe in this case. I may also mention that Mr. Smith saw them on the cliffs and sea shore, and, in this case, they seemed nearly confined to Buckland, which is nearly three miles from the town of Dover.—C. G. HALL, 14, Granville Street, Dover: *August* 15*th*, 1887.

Rare Aculeate Hymenoptera in 1887.—I have taken two species of considerable interest this season, which I had not met with previously. The first is ***Passalœcus monilicornis***, of which four ♀ occurred, three of them near our house, and one near Wotton-under-Edge, about eight or nine miles from here. The other is ***Halictus atricornis***, Sm., of which I took a single male in the woods near Wotton. I am not aware that it has ever been taken in any other locality than the Cheshire one before. —R. C. L. PERKINS, Sopworth Rectory, Chippenham: *July*, 1887.

Macropis labiata at Woking.—On the 30th July, Dr. Capron and myself visited Woking to look for this curious bee which Mr. Enock has so often taken on the *Lysimachia vulgaris* along the banks of the Woking Canal. We were each of us successful in taking a fair series of both sexes in very fine condition, flying about and settling on the *Lysimachia*; the males, however, seemed quite equally attached to the *Alisma*, which was growing in abundance in the water, in fact, I think I saw more males on the *Alisma* than on the *Lysimachia*. On leaving our hunting ground we were surprised to find both sexes plentifully on the common thistle, *Cnicus arvensis*. Mr. Bridgman also used to take it near Norwich on thistle, so it is evident that it is a species which is not very particular as to the plant it visits.—EDWARD SAUNDERS, St. Ann's, Bromley, Kent: *August* 15*th*, 1687.

Local Hemiptera at Bromley, Kent.—During the last month I have taken, on the common willow, *Salix alba*, two species of *Hemiptera*, which are certainly far from common generally, although probably locally abundant—these are *Orthotylus diaphanus*, Kb., and *Plagiognathus Roseri*, H.-S., both of these have occurred pretty freely by beating the willows over an umbrella; with these I had the good fortune to secure a single specimen of *Oliarus leporinus*, thus adding an additional locality to those already known for this rare *Homopteron.*—Id.: *August*, 1887.

Diptera in Epping Forest.—Very few large *Diptera* were about when last I visited this place (July 21st). The *Acalypterate Muscidæ*, which I was chiefly in search of, were tolerably abundant, the genera *Chlorops*, *Meromyza*, *Borborus*, and *Sapromyza* being well represented. There were also two or three species each of *Scatopse*, and *Agromyza*. *Hemiptera* were rather common, and a few beetles fell to my sweeping. The unfortunate proximity of the numerous stalls and booths that encircle what was once the forest, causes the remaining portion of the wood to be thronged with pleasure seekers, with the natural result of the gradual annihilation of insect life. I have some duplicates to spare should any one want them.—E. Brunetti, 129, Grosvenor Park, Camberwell: *July*, 1887.

Obituary.

Dr. Max Gemminger died at Munich on the 18th April last, having been born in the same city on the 23rd January, 1820; thus he did not long survive his younger and (in Entomology) better-known *collaborateur* Baron Von Harold. In early life he appears to have held an official position in the Museum at Trieste, but returned to Munich in 1849. Outside the great "Catalogus Coleopterorum," the idea of which he possibly originated, and which, in conjunction with Von Harold, he carried to so successful a conclusion, his entomological publications were not numerous, but as long as there are systematic Coleopterists, so long will "Gemminger and Von Harold" be familiar as household words. As a general naturalist he was known in connection with pisciculture, and especially as a skilled preparer of anatomical subjects for educational purposes. He was M.D., but probably never practised, his duties at the Munich Museum fully occupying his time.

Robert Francis Logan died at his residence, Spylaw, Colinton, near Edinburgh, on the 28th July, at the age of 60.

He was a very good observer on whom one might always thoroughly rely—but with this great capacity for benefiting our science, he was unfortunately extremely deliberate, and it was but very little of that which he had observed that was ever given to the world. He would seemed to have turned his attention to Entomology before he had reached his *teens*, as in his first published note (Zoologist, 1845, p. 1141), written when he was 18, he said "I have now been investigating the Entomology of this locality for about seven years."

This note referred to the capture at Duddingston (where he resided), near Edinburgh, of two specimens of *Polia occulta*, then an insect of very great rarity. In the Zoologist of the following year were notices of "Flowers which are particularly attractive to moths," of "*Graphiphora renigera*" (the insect we now know as *Agrotis lucernea*, it having borne for some years the name of *Graphiphora* or or *Spælotis cataleuca*). This insect was very rare with us in those days, but, occurring not uncommonly on the steep stony slopes of Arthur's Seat, an Entomologist settled at Duddingston had unusual opportunities of investigating its habits. Mr. Logan had bred the insect from a larva found under a stone in February, 1845, and thus became acquainted with the locality and habit of the species. A description of the larva followed at p. 1347 of the Zoologist for 1846.

His next notice was in the Zoologist for 1848, p. 2034, being a "Description of *Ephippiphora turbidana*, a new British Moth of the Family *Tortricidæ*." In the Zoologist for 1849, p. 2626, are three short notices by Logan:—"*Glyceria fluitans* attractive to moths," "Moths and Honey-dew," and "On setting *Lepidoptera* flat."

It is rather singular that none of the foregoing communications to the Zoologist are recorded in Hagen's Bibliotheca Entomologica, but the note on *Glyceria fluitans* seems to have been honoured with a German translation in Froriep's Tagsbericht, and thereby appears in Hagen as Logan's first article: "*Glyceria fluitans* zieht die Nachtschmetterlinge an."

Thenceforward, Logan was a contributor to the Transactions of the Entomological Society of London, to the Proceedings of the Royal Physical Society of Edinburgh, to Morris' "Naturalist" (where, in 1852 and 1853, in conjunction with Dr. W. H. Lowe, he brought out "The Lepidopterous Insects of Mid-Lothian," extending to 17 pages), the Entomologists' Weekly Intelligencer, &c.

After attending almost exclusively for many years to *Lepidoptera*, Logan had latterly turned his attention to *Coleoptera*, and, during the last few years, several notices of the capture by him of scarce Scottish beetles have appeared in the pages of this Magazine.

One of the day dreams of Mr. Logan's youth was the production in numbers of a work entitled "Illustrations of Scottish Lepidoptera," giving the transformations of a variety of species; of this, the first number was, we believe, prepared, but never published, and we fear the work never made further progress.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY: *July 28th*, 1887: R. ADKIN, Esq., F.E.S., President, in the Chair.

The Rev. W. F. Johnson was elected a Member of the Society.

Mr. J. T. Williams exhibited bred examples of *Phorodesma smaragdaria*, H., and *Dianthœcia irregularis*, Hufn. Mr. West (Streatham), *Apamea ophiogramma*, Esp., taken in his garden. Mr. Tugwell, *Apatura Iris*, L., with pupæ cases. Mr. Hall, varieties of *Abraxas grossulariata*, L. Mr. South, two varieties (♂ ♀) of *Melitæa Cinxia*, L., the usual dark fulvous marginal band of the under-side breaking up into spots, or having a tendency to form ocelli; taken in the Isle of Wight, in the same spot, on the 11th and 17th June respectively. Mr. Dobson, *Lepidoptera* from the New Forest. Mr. R. Adkin, living larvæ of *Spilosoma mendica*, Clerck, reared from ova obtained from the Cork form of the species. Mr. Sheldon, *Pempelia palumbella*, H., from Leith Hill; *Ephippiphora nigricostana*, Haw. (bred); and *Eupœcilia amandana*, H.-S., which he stated he had taken in great numbers near Croydon.

August 11th, 1887.—R. SOUTH, Esq., F.E.S., Vice-President, in the Chair.

Mr. Watson exhibited *Catocala promissa*, Esp., from the New Forest. Mr. West (Streatham), bred series of *Sesia asiliformis*, Rott.; varieties of *Lycæna*

Corydon, Fb.; and *Argynnis Euphrosyne*, L. Mr. Wellman, *Dianthœcia albimacula*, Bork.; *Bryophila muralis*, Forst.; a yellow variety of *B. perla*, H.; *Plusia interrogationis*, L., from Perth; dwarfed forms of *Aspilates gilvaria*, H.; *Eubolia bipunctaria*, Schiff., and *E. limitata*, Scop.; and living larvæ of *Chariclea umbra*, Hufn., feeding on knot-grass. Mr. Mera, *Thera simulata*, Hb., from Ireland. Mr. Fremlin, a variety of *Vanessa urticæ*, L. Mr. South, a variety of *Triphæna comes*, Hb., the hind-wings being a creamy-white; and a variety of *Vanessa Io*, L. The Secretary, on behalf of Mr. Lewcock, exhibited a number of species of *Coleoptera* obtained chiefly in Surrey, and read notes; there were twelve species of *Donacia*, including *Donacia hydrochæridis*, F., *D. lemnæ*, F., *D. linearis*, Hoppe., *D. menyanthidis*, F., and *D. comari*, Suf.; also *Bembidium lunatum*, Duft., about a dozen specimens taken on the banks of the Thames at Rainham, Essex, during August of last year; several species of *Malachius*; *Cryptocephalus lineola*, F., and many others. The Secretary read a letter from Mr. Adkin recording the unusual abundance of *Pieris brassicæ* and *P. rapæ* in the neighbourhood of Eastbourne; and several Members contributed the result of their observations in different localities, and a discussion ensued as to the probable cause of the appearance of these species in such numbers in the southern counties, in which Messrs. Rendall, South, Carrington, Tugwell, Wellman, Hall, Sley, and others took part.—H. W. Barker, *Hon. Sec.*

Entomological Society of London: *August* 3*rd*, 1887.—Dr. David Sharp, F.Z.S., President, in the Chair.

Mr. John Witherington Peers, M.A., of Wendover, near Tring; and Mr. R. G. Lynam, of the North Staffordshire Infirmary, Stoke-on-Trent, were elected Fellows of the Society.

Jonkeer May, the Dutch Consul-General, exhibited a pupa and two imagos of *Cecidomyia destructor* (Hessian Fly), which had been submitted to him for exhibition by the Agricultural Department.

Mr. W. White exhibited, and made remarks on, a specimen of *Philampelus satellitia*, Linn., from Florida, with supposed fungoid excrescences on the eyes. Mr. Stainton said he was of opinion that the supposed fungoid growth might be the pollinia of an Orchid. Mr. Poulton expressed a similar opinion, and the discussion was continued by Mr. Pascoe, Dr. Sharp, and others. He also exhibited a bred specimen of *Catephia alchymista*.

Mr. McLachlan sent for exhibition a number of oak leaves infested by *Phylloxera punctata*, Lichtenstein, which he had received from Dr. Maxwell Masters, F.R.S.

Mr. Champion exhibited two rare species of *Curculionidæ* from the Isle of Wight, viz., one specimen of *Baridius analis*, and a series of *Cathormiocerus socius*. He remarked that *C. maritimus*, Rye, had been placed in recent European Catalogues as a synonym of the last-named species, but this was an error. He also exhibited a series of *Cicindela germanica*, from Blackgang, Isle of Wight.

Mons. Alfred Wailly exhibited, and made remarks on, a number of living larvæ of *Antherœa Pernyi*, *A. Mylitta*, *Telea Polyphemus*, *Platysamia Cecropia*, *Actias Luna*, *Attacus Cynthia*, *Callosamia Promethea*, and other silk-producing species. He also exhibited imagos of the above species, imagos of *Antherœa Yama-mai*, and a number of species of Diurni from Sarawak.

Mr. Poulton exhibited crystals of formate of lead obtained by collecting the secretion of the larva of *Dicranura vinula* on 283 occasions. The secretion had been mixed with distilled water in which oxide of lead was suspended. The latter dissolved, and the acid of the secretion being in excess the normal formate was produced. Prof. Meldola promised to subject the crystals to combustion, so that their constitution would be proved by the final test.

Mr. Oliver Janson called attention to Mr. Pryer's new work, "Rhophalocera Nihonica," and to the fact that the illustrations had been executed by Japanese artists.—H. Goss, *Hon. Secretary.*

NOTE ON SOME BRITISH *COCCIDÆ* (No. 8).

BY J. W. DOUGLAS, F.E.S.

Lecanium beaumontiæ, *n. sp.*

♀ scale oval or obovate, very convex, light brown, the surface closely covered with minute whitish dots; on each side, at some distance from either end and from each other, two more or less strong transverse ridges, outwardly going, almost at a right angle, to the margin, inwardly joined to a strong longitudinal dorsal ridge, which sometimes extends beyond them in a less degree to the anterior and posterior margin; the margin all round somewhat broad and flattened. On the dorsal ridge is a series (three or four) of conspicuous white tubercular points, sometimes in two rows, and the lateral ridges are similarly furnished; in some mature examples the lateral ridges are almost obsolete, but their position is indicated by the raised white points. Antennæ too imperfect to describe.

Considerably like *L. filicum*, but smaller, and very distinct from that and all other species by reason of the white points on all the ridges.

Length, 3, breadth, 1·75 mm.

On a young terminal shoot of *Beaumontia grandiflora*, a native of the East Indies, received from the Royal Gardens, Kew, in February, these scales were thickly clustered. The young scales were pale and moved about freely; the mature scales (of which there were but few) contained numerous white eggs. No male scales.

Lecanium testudo.

Coccus testudo, Curtis, Gard. Chron., 1843, p. 444, and fig.

"♀. Adult, oval, very convex, dark brown, and from the similarity to a tortoise, I have named this scale *Coccus testudo*: there is an elevated ridge along the back, with two transverse ones, the first being nearest the middle, the second towards the tail; the whole of the surface is finely shagreened, with small white tufts scattered over the whole. The under-side of the scale has a broadish margin, which is ciliated, and there is a long cleft at the tail; the skin of the body is concave, dark, with a purplish tinge, with six minute legs and a largish lobe towards the anterior portion, which is furnished with a fine proboscis" (Curtis, *l. c.*).

To this may be added—length, 3—4, breadth, 2—3 mm.; antennæ pale, 8-jointed; legs unicolorous with the body; the margin of the scale, seen from beneath, is not well described as "ciliated," for the hairs or spines are stout and not close together, and the "white tufts" on the surface are really waxen projecting granulations.

Curtis's description so well fits the insect I have before me, that I cannot do better than adopt it, with the foregoing small addition. His description was made, 43 years ago, from two examples on a leaf of *Brexia spinosa*, a native of Madagascar; the scale does not appear to have been identified since, until that by the kindness of the Director of the Royal Gardens at Kew, I received thence, in February, a specimen attached to a leaf of *Brexia madagascariensis*, and two others full of yellow eggs on a shoot of *Cratæva gynandra*. The ♂ is unknown.

Signoret, following Targioni-Tozzetti, thinks that *L. testudo* may be the same as *L. cycadis*, Boisd., which I know only by a single scale kindly given to me by Dr. Signoret, and which does not well agree with my scales of *L. testudo*, but I am not in a position to judge by one example. (Signoret gives the length of the scale of *L. cycadis* as "about 5 centimètres," which is surely a misprint for 5 millimètres). If there be but one species, Curtis's name is the older. I am not sure of the number of the joints in the antennæ of *L. testudo*, the concavity of the reversed scale being so great that a good view of the antennæ is not to be had without the destruction of the scale, which I cannot afford to effect. Signoret says nine joints in *L. cycadis*. The ♂ of *L. cycadis* is unknown.

My specimens of *L. testudo* are all but identical with scales of *L. oleæ*, Bernh., which I received from Professor Comstock, the chief apparent difference being that the white specks thereon are smaller than on mine. Signoret says the male of *L. oleæ* was unknown to him, although the female was common (Ess. Cochin., p. 271). Comstock states that although the ♀ was abundant on many trees in California, the ♂ was unknown. (Report for 1880, p. 336). *L. oleæ* has but eight joints in the antennæ.

Whatever may be the result of future investigations, the foregoing allusion to *Lecanium cycadis*, Boisd. (1867), gives opportunity to mention that the species appears to have been previously indicated by A. H. Haworth under the name of *Coccus palmæ*, in the "Transactions of the Entomological Society of London," vol. i, p. 307 (1812). The identity is the more assured in that Haworth's species evidently belongs to Signoret's very restricted "Série 5" of *Lecanium*, of which the leading character of the scale is "distinguished from all others by the rugose surface and the dorsal disc presenting one longitudinal and two transverse carinæ" (Ess. Cochin., p. 268), and by the consideration that of the three species thus denominated (*L. cycadis*, *testudo*, and *oleæ*), *C. palmæ* quite agrees with *cycadis*. I subjoin Haworth's description:—

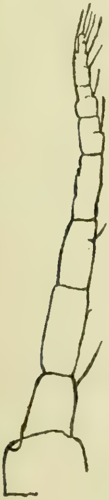
"Palmæ. *Coccus testa rufo-fusca unicolore, ovali-convexa rugulosa linea dorsali fasciisque duabus elevatis transversis.*

"Habitat in Palmæ foliis Horto Chelseiano, copiose. Pestis morbida, fœda.

"Long corp., 2 lin., lat., 1¼."

Haworth gives as a doubtful synonym, "*Coccus aonidum*, Gmel., Syst. Nat., 2215, 2 ?" but the description is only that of Linné (which is not referred to) transposed, with one or two interpolations, and does not at all agree with that of Haworth; for instance, it has "Testa orbiculata, planiuscula, atro-purpurascente: centro s. vertice tuberculato, rotundo, rubro, in senescentibus aperto." This points to an Aspidiotid, not to a Lecanid, and Targioni and Signoret have so adopted *Coccus aonidum*, Linn., as the type of *Aonidia*, a new genus of *Diaspina*.

LECANIUM LONGULUM, *n. sp.*



♀ scale dingy pale yellowish-grey, elongate, narrow, ends broadly rounded, side margins slightly curved out, not recurved; surface smooth, transversely arched, longitudinally level semi-cylindric, not carinate, a band of faintly dark reticulation along the sides, whence, in some examples, faint dark lines radiate to the margin; the disc occupied with a long, pale, clear, oval spot; or in some mature specimens the scale is unicolorous yellow-brown, the dorsal pale spot partly or wholly covered and on the sides minute pale dots in place of reticulation. Under-side all pale, a broad space all round the insect, a conspicuous blackish eye-spot above each antenna. Antennæ of eight joints ?: the 1st short; the 2nd longer, about the same length as the 4th; the 3rd longest of all; the 5th longer than the 4th, but not so long as the 3rd; the 6th, 7th and 8th shortest, the 8th longest of the three, which (especially the terminal) have all gradated sides. The 8th, indeed, simulates two joints, but the gradated structure and the want of colour make it impossible to determine with certainty whether or not there is a real articulation (fig.). Young larvæ under the scales. Length, 4—5, breadth 2—2·25 mm.

No male scales seen.

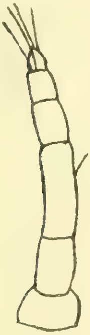
A scale remarkable for its length, narrowness, and semi-cylindric form.

On stems (rarely on the leaves) of *Acacia catechu*, from Mr. James O'Brien, Harrow; on the same plant, *Anona muricata* and *Myrica* *fragifera* from the Royal Botanic Society's Gardens; and on *Averrhoa carambola* and *Spathophyllum blandum* from the Royal Gardens, Kew; all in February.

LECANIUM FUSCUM

Réaumur, Mém., iv, pl. v, fig. 2 (1740).
Chermes quercus rotundus fuscus, Geoffr., Hist. Ins., i, p. 507, 11 (1764).
Chermes quercus (*nec* Linn.), Fourcroy, Entom. Paris, i, p. 229, 11 (1785).
Coccus fuscus, Gmel., Syst. Nat., 13th ed., p. 2221, 33 (1788).
Nec Lecanium fuscus, Sign., Ess. Cochin., p. 250.

♀ form spheroid (diam. 6 mm.) or oblate-spheroid, the transverse diameter (7 mm.) being greater than the longitudinal (6 mm.), height in either case 5 mm. (the excised part of attachment subtracting from the sphere), constricted as if by a ligature close above the part of adhesion to the branch, but leaving a comparatively small orifice for attachment, more or less round according to the exigencies of its position on the shoot; pale yellow-brown, with an undefined yellowish band down the middle, the colour spreading out on each side of it in several small angles (eventually the colour of the scale is wholly light fuscous-brown); surface smooth, with a very few distant punctures somewhat in rows, and around the basal circumference many larger and deeper; the posterior cleft short, the superior opening in it small, obovate; anal point very small. Antennæ short, of six joints—1st short, 2nd more than twice as long, 3rd nearly twice as long as 2nd, 4th shorter than 2nd, 5th still shorter, 6th shortest of all with a few hairs attached. Larvæ yellowish, short broad-oval, antennæ of six joints.



No male scale seen.

Réaumur (*l. c.*) says—

> "Fig. 2 est celle d'une petite branche d'un chêne ordinaire à laquelle tient une Gallinsecte plus grosse que le Kermes et qui est presque sphérique."

This figure exactly represents the scale I have before me, even the median yellow band with jagged sides being indicated.

Geoffroy (*l. c*) refers to Réaumur's figure, does not name his species, uses only the four words quoted above, and adds, "Il ne paroît pas différer de celui de l'orme." But the resemblance to that species (*Lecanium ulmi*, Linn.) is remote, and this is confirmed by the opportune arrival on July 4th of some scales of *L. ulmi* just gathered from wych elm (*Ulmus montana*) at Alford, Lincolnshire, by Mr. James Eardley Mason, which quite corroborate my opinion, they being of less regular form, not so uniformly smooth, of a deep chestnut or piceous-brown colour, and with a large basal opening for attachment to the branch.

Fourcroy, who, in his "Entomologia Parisiensis," gave names to Geoffroy's insects, says of this species (*l. c.*)—

> "No. 11. *C. quercus*, Le Kermes rond et brun du chêne. *C. quercus rotundus fuscus.*"

The name given, taken as that of Linné, is incorrect, for Linné himself, in the "Systema Naturæ," p. 740, No. 5, refers his *Coccus quercus* to "Réaumur Ins., iv, t. 6, f. 1—4," adding "Habitat in *Quercu robore*;" but neither then, nor in the "Fauna Suecica," giving any description. Réaumur (*l. c.*) says of it, *i. e.*, of figs. 1—4, that it is "une Gallinsecte en forme de rein;" this in no way applies to the fig. 2 of pl. v, representing our *L. fuscum*, which, as he says, is "presque sphérique." This figure No. 2 is not referred to by Linné for any of his species of *Coccus*.

The name *fuscus* was first applied to this species by Gmelin in the 13th edition of Linné's "Systema Naturæ," where (*l. c.*) he has—

> "*Coccus fuscus*. *C. quercus fuscus*, Modeer, Act. Goth., i, 24, 18. Geoffr. ins. par. i, 507, 11. Réaum. ins., iv, t. 5, f. 2.
>
> Habitat in quercu robore, albo tomento obductus."

The last three words are an addition of his own, and refer, I presume, to the cottony matter enveloping the eggs and covered by the scale; they are not in the original of Geoffroy or Réaumur which are cited. The reference to Modeer is not correct, either as to the name or its applicability to the species of Geoffroy and Réaumur indicated. Modeer (*l. c.*) has—

> "EK FÄSTFLYET (*Quercus roboris*). Female scale reniform, or as if with both ends curved together, dark brown, bedecked with a white powder. . . Geoffroy calls this 'Fästfly' *Chermes quercus reniformis*."

This is equivalent to *Coccus quercus*, Linn., as before stated, and is not the *C. fuscus* here denoted.

In his "Essai sur les Cochinelles," p. 250, Signoret describes a *Lecanium fuscus* which he attributes to Geoffroy (meaning, no doubt, his "No. 11, *Chermes quercûs rotundus fuscus*," cited above), yet at the same time he disallows that the figure in Réaumur's pl. v, fig. 2, cited by Geoffroy to illustrate his species, represents it. Thus he says—

> "Dans notre Catalogue nous avons indiqué l'espèce de Réaumur, pl. v, fig. 2, comme étant le *fuscus*, Geoffroy, puisqu'il y renvoyait; mais la figure de Réaumur se rapporte à un autre type qui pourrait bien être le *L. Emerici*, Planchon, car il dit 'Elles sont très semblables, par leur figure et leur grosseur, au *Kermes*, et leur couleur est peu différente de celle du Kermès pâle.' Un peu plus loin il ajoute:— 'qui y tiennent (aux chênes) par une base circulaire qui a peu de diamètre,' tandis que, dans *fuscus*, c'est une sphère coupée en deux et par conséquent tenant à l'arbre par une large surface circulaire, ce qui se rapporte à Geoffroy disant qu'elle ressemble à celle de l'orme."

But, at p. 274 (under *Lecanium Emerici*, Planchon), Signoret says—

> "Dans le première parti de cet ouvrage (p. 23 and p. 250) je disais qu' *Emerici* était connu et que c'était le *quercus* de Réaumur. En effet, planche v, fig. 2, il représente une espèce qui a la plus grande ressemblance avec *Emerici;* cependant, comme il indique les chênes ordinaires comme habitat, il est plus que probable que ce n'est pas le même."

I agree with this; *Emerici*, and all the other allied species which Signoret refers to his genus *Kermes*, live only on *Quercus coccifera* or *Q. ilex* in the South of Europe, while *Lecanium fuscum* lives only on *Quercus robur.*

Signoret (*l. c.*) describes his *Lecanium fuscus* (of which he had only a single example, taken from an oak at Vienna) thus:—

> "Elle est d'un brun marron, fortement ponctuée sur les côtés, lisse sur les dos, demi-sphérique, un peu étranglée vers l'insertion sur la branche."

Now, "une sphère coupée en deux," or "demi-sphérique," is not the "rond" of Geoffroy nor the "presque sphérique" of Réaumur, and a restricted meaning is placed upon the remark of Geoffroy, "Il ne paroît pas différer de celui de l'orme," that the words do not warrant; therefore, whatever the "*fuscus*" of Signoret may be, it is not the species of Geoffroy, to whom he attributes it, nor of Réaumur, which is all that I am now concerned to show.

The conclusion of Planchon, as expressed by Signoret, p. 274, "La plus grande confusion n'a cessé de régner sur les espèces vivant sur le chêne, ce qui n'est pas étonnant, à cause de leur ressemblance" is very just.* It is now not possible in many cases to identify a species so surely as to be able to give due credit of priority of name, mainly by reason of the too succinct or imperfect description and account of similar species given by former authors. In fact, among the *Coccidæ*, especially in the *Lecanidæ*, where the appearance varies greatly during the course of the life of a species, the insect should be closely observed in all its stages, in order to form a correct idea of specific character.

On June 24th, Mr. G. C. Bignell, of Stonehouse, Devon, sent me, from an oak in his district, some scales, described above (six of the spheroid form and two of the oblate-spheroid), all, except this slight deviation, being otherwise exactly alike; and with them the following information:—

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* "Il règne à cet égard, dans les ouvrages des auteurs modernes, de singulières confusions. Les uns altèrent les vrais caractères du Kermès, en y ajoutant des particularités qui n'appartiennent qu'aux espèces voisines; d'autres, allant encore plus loin, négligent ces caractères pour y substituer ceux d'espèces différentes De là résulte une confusion que peuvent seules faire cesser les observations directes." Planchon "Le Kermès du chêne," p. 17. Paris, 1864.

"In searching for oak galls yesterday I found the enclosed on the branches, mostly on or near the terminal bud of last year, that is, at the base of this year's growth, and they were on one tree only, as far as I could see. I opened one, and it appeared to be a mass of eggs, and I found some Hymenopterous larvæ feeding thereon."

About the middle of July a quantity of the larvæ of the *Lecanium* came out and moved rapidly about, and at the same time a few of the parasites appeared in the imago state; they are most probably *Blastothrix sericea*, Dalm., a species of *Encyrtidæ* obtained by Dalman from his *Coccus gibber* (*cf. infra*).

(To be continued).

SPHINX CONVOLVULI IN NORFOLK, IN 1887.

BY CHAS. G. BARRETT, F.E.S.

When visiting Mr. Norgate at Downham last spring, I was greatly interested by his account of the extreme partiality shown by the larger hawk-moths for the flowers of *Nicotiana affinis* (white tobacco). He had seen several *Sphinx convolvuli* at one time flying round it in his own garden.

I had never seen that grand moth on the wing, nor did I possess a decent series, so took care to secure a nice lot of young plants of *Nicotiana affinis*, and get them forward by the time that all risk of night frosts was over. They were then planted in two rows at the back of beds of petunia and verbena respectively, and soon came into flower, so as to form, with their abundant opaque-white blossoms, a very effective background to these beds in the evening—though it must be confessed that in the day-time they were not equally pleasing, from a curious habit of closing many of their blossoms, and exhibiting only the dusky backs of the petals. Their perfume at night was delightful, and for the special purpose for which they were planted they must be pronounced an immense success.

On August 22nd, we were delighted by a sight of the first *Sphinx convolvuli*—excessively wild and shy. It was not then captured, nor on the following evening, when it (or another) appeared, but afterwards we had better success. From that time until last Friday (September 9th) specimens were seen almost every evening, and generally secured, and the total taken by my boys and myself exceeds a score. At the same time we hear of specimens taken in all directions: at rest in the day-time, or rushing wildly into houses at night, attracted by the lights or the flowers, and causing a desperate commotion when unable to find the way out again. Others were take at flowers in the gardens, and altogether a very respectable numbe have been secured in the neighbourhood.

Nothing that I have ever seen in the evolutions of *Apatura Iri* or *Limenitis Sibylla* approaches in grandeur and power of flight t the motions of these noble moths. Their movements resemble i ease and grace those of a swallow, but far exceed it swiftness. Ther is something wonderfully lovely in their manner of glancing abou from flower to flower, or skimming round the beds. By moving gently with little perceptible movement towards them, it is easy to watc them for ten minutes at a time, sometimes within a few inches examining flower after flower, then circling round or gliding to anothe part of the bed, hovering about two inches from each flower, an probing its deep nectary, with a proboscis from three to four inche long. The petunias and verbenas get a share of attention, as als occasionally the neighbouring geraniums, and even the long tubula flowers of a large species of datura are not entirely overlooked, bu not one of these plants approaches in attractiveness to the *Nicotiana*, to which the moths always return, and about which they spend mos of their time.

The slightest *sudden* movement alarms them, and causes a instantaneous retreat, but as long as we move gradually and smoothly they seem to disregard us, and a lighted lantern is actually an object of curiosity. It is most curious to see one of these moths on the approach of the light leave the flowers and hover in front of it, then rise higher, pause in front of one's face with uplifted wings, as though looking straight into one's eyes (an attitude which has certainly been seen by some of our earlier artists, for their figures exactly represent it), then pass with a loud hum close to one's ear, and return, as though satisfied, to the flowers. But the most curious performance that we have seen happened in two cases, when one o the boys, wearing a scarlet-striped jacket, was watching one of thes moths. In each case the moth actually flew close to him, evidently actuated by the most lively curiosity, and appeared to touch the scarlet stripes.

S. convolvuli does not hold itself bound by the crepuscular habits of its family. It is a creature of intelligence as well as of curiosity, and knows that the twilight is too short for all the floral investigation which its large appetite demands. We have taken them at all hours, from dusk (7.30 p.m.) to midnight—later, I confess that we have not attempted much; and the state of the weather, if not *too* cold, affects them but little. One of our best nights—when six were taken—was beautifully fine, with bright moonlight, the other—when seven or eight were seen, and five taken—was exceedingly wet and stormy. Certainly, rough weather is no great obstacle to them, they only seem to be rendered more careless of danger by the rough blowing about of the flowers, and I have little doubt that they are attracted a long distance by the rich perfume carried away by gusts of wind.

To the Carlylean query, "whence?" it seems politic to offer no opinion. My friends here (who eagerly claim these charming insects as genuine natives of Norfolk) urge that *Convolvulus* is quite sufficiently abundant—as it certainly is (three species),—but I have a strong suspicion that a reinforcement has arrived from abroad to join the native contingent. If so, the journey has not injured them much, either in beauty or activity. One curious circumstance about them is the very large preponderance of females, especially in the earlier captures. Of our twelve earliest specimens, only one was a male. I hear that just lately the conditions are reversed, but not more than one-fourth of *our* specimens are males.

King's Lynn, Norfolk:
September 13*th*, 1887.

Sphinx convolvuli at Lee, Kent.—A fine ♀ of this insect was brought to me on the 18th inst. It was taken in a garden in the neighbourhood.—C. Fenn, Burnt Ash Hill, Lee: *August* 22*nd*, 1887.

Sphinx convolvuli in Birmingham.—A specimen of this insect was captured last week in Bellbarn Road. It was found on a doorpost.—W. Harcourt Bath, Ladywood, Birmingham: *September* 7*th*, 1887.

Sphinx convolvuli at Newmarket.—*S. convolvuli* came into my dining room and buzzed about the ceiling; one had been caught a few days before in a neighbour's garden; and Mrs. Verrall saw two just outside the front door a few days afterwards, but when I came with my net they were gone.—G. H. Verrall, Newmarket: *September* 18*th*, 1887.

Sphinx convolvuli at Cambridge.—Two specimens of *Sphinx convolvuli* have recently come into my hands. The first was captured in a house near here (Mill Road) on August 19th, the other was knocked down by a boy three or four days ago as it was flying on the Newmarket Road, near the Barnwell Railway Station. The last named was a good deal worn, the other was in beautiful condition and apparently not long emerged.—Albert H. Waters, Willoughby House, Mill Road, Cambridge: *September* 12*th*, 1887.

ON A SPECIES OF THE FAMILY *GELECHIDÆ*, HITHERTO UNRECOGNISED IN ENGLAND.

BY WILLIAM WARREN, F.E.S.

In the summer of 1858, Mr. Bond took in Wicken Fen some specimens of a brownish, narrow-winged *Gelechia*, which I found placed in his cabinet as *arundinetella*. Among them there was, in fact, a single specimen of this latter insect, also caught at Wicken; which, being in very good condition, and almost as dark as the others, had, no doubt, led to the confusion of the two species. Mr. Bond kindly gave me a type of the insect: this was in the spring of 1886. During that summer Mr. W. Farren, of Cambridge, worked Wicken Fen pretty thoroughly, and among the *Micros* captured there by him I detected, in the autumn, several examples of the species taken by Mr. Bond so many years before. Mr. Farren had passed them over, and even sent some away as *morosa*. I have also heard from Mr. Fletcher, of Worthing, that he possesses a pair of a *Gelechia*, taken a few years ago in Wicken Fen, which he marked ? n. sp., intermediate between *acuminatella* and *morosa*. This summer more have been taken by Mr. Albert Houghton, and I have thus been enabled to identify the species as *Doryphora quæstionella*, H.-S., a rather indistinct, obscure-looking insect, allied to *morosa*, Mühl., but with *brownish*-black, not *bluish*-black, and more elongate, fore-wings. The species is figured by Herrich-Schäffer, vol. v, fig. 587, and may be described as follows:—

F. w. brownish-black, elongate, of equal width throughout, with the apex rounded; the three dots only just perceptible; from the costa before the apex a small pale dash runs obliquely outwards towards the hind-margin, as in *arundinetella*, and, much more conspicuously, in *Cleodora cytisella*: but this pale dash is not always perceptible; the hind tibiæ are conspicuously ochreous.

Heinemann gives Zurich as the only locality for the insect, and *Lotus corniculatus* as its food-plant; but it is worth mentioning that Prof. Frey, of Zurich, who once bred the species from an unobserved larva, does not name *any* food-plant. The imago appears during the latter half of July and the beginning of August, and is caught flying round flowers before dusk, and taken at light afterwards. Mr. Stainton considers it to be closely allied to *arundinetella*.

It may be well to correct here a slight error which appears in Heinemann's account of the food-plants of *morosa*. He gives both *Lysimachia vulgaris and Lythrum salicaria*. This is wrong: the larvæ that feed in the *Lythrum* are those of *subdecurtella*. The larvæ of the two species are much alike, and feed in similar ways, mining down the young central shoots.

Merton Cottage, Cambridge,
September 13*th*, 1887.

DESCRIPTION OF A NEW *GELECHIA* OF THE "*LITA*" GROUP, CLOSELY ALLIED TO *G. MACULEA.*

BY J. W. TUTT, F.E.S.

GELECHIA (LITA) BLANDULELLA, *n. sp.*

Expanse, 4—4½‴. Palpi whitish-grey, thickened towards the base, widely separated, curved upwards for more than half their length; antennæ white with fuscous rings throughout their entire length; head white; thorax white, freckled with a very few pale grey scales; abdomen white, freckled a little more thickly than the thorax, giving it a slightly darker appearance.

Anterior-wings—ground colour very pure white, with a few greyish scales near the base, where a slender black line is sometimes noticeable; at about one-third from the base a dark fuscous (black on the edge of the costa) streak, slanting towards the centre of the wing, terminated at the median nervure, and showing a faint trace, when it reaches the median nervure, of being turned back on the costa, so as to form a letter V, the exterior side of which is nearly invisible; parallel with the hind margin the white ground colour shows up as a slender, distinct, once-angulated, white fascia, being shaded on either side with fuscous scales, which are more thickly sprinkled on the costa; at the apex of the wing there is often a distinct dark dot; on the centre of the disk three dark dots, one just exterior to the dark streak, and two nearly in the centre of the wing (the three being in the same straight line), the two latter are sometimes joined to form a short streak. In a few specimens the oblique line is obsolete, and represented only as a dot on the median nervure. Posterior-wings pale, shiny grey, paler at the base; cilia on both anterior and posterior-wings the same colour as the hind-wings. Under-side of an unicolorous pale whitish-grey; tarsi white.

Time of appearance, from end of July to the middle of August.

This insect closely resembles *Gelechia* (*Lita*) *maculea*, but the great difference in size at once distinguishes it. The markings, too, are slightly different. In *maculea* I find that when the oblique line reaches the fold, it is sometimes carried for a short distance along the central nervure somewhat like the letter L, with no trace of an upward tendency, while in *blandulella* the black mark is (if continued) sharply angulated and carried faintly upwards to meet the costa, thus forming a V mark. In *maculea*, too, the pale fascia shows a decided tendency to double angulation; in *blandulella* the angulation is always single. In *maculea* there is no trace of the slender black line noticeable in some specimens of *blandulella*.

Mr. Stainton, who has proposed for this insect the name *blandulella*, suggested that I should describe the species under that name, *blandella* being a synonym of *maculea*; he has also pointed out that the hind margin of *blandulella* is rounder than in *maculea*.

I have taken this species on the Deal Sandhills for four years (one or two being captured in 1884), along with the common *L. marmorea*.

Last winter I was much struck with the variation in my series of sandhill *Litæ*, and the kind offices of friends in naming very similar types as different species, coupled with the fact of a new species (*semidecandrella*) having just been differentiated, puzzled me to such an extent, that I put my difficulties (in a very crude form, certainly) into print (Entom., xx, 28). As a result, I at once got the aid of several of our best entomologists, to whom my insects were in many cases new. Thanks to Messrs. Stainton, C. G. Barrett and Threlfall I have partly extricated myself. My Nos. 1 and 2 (Entom., xx, 29) will be referred to *blandulella*, 3 and 4 to *semidecandrella*, whilst my black one may be a var. of *marmorea*.

May I add, that those who have a series or partial series of *Knaggsiella*, other than those originally taken by Mr. Barrett, would do well to scrutinize them carefully. From all I can gather these are still unique as British, and the few he captured will not account for all I have seen marked on exchange lists, &c. Those who have *Knaggsiella* from the south coast will probably find them *semidecandrella*, with an occasional *blandulella*. The species are all distinct enough, when one has had their special characters pointed out to him, and sees them side by side, but one rarely has this chance.

Rayleigh Villa, Westcombe Park, S.E.:
September 7th, 1887.

ON THE TRUE DISTINCTION BETWEEN *LITHOSIA COMPLANA* AND *L. LURIDEOLA*.

BY ARTHUR G. BUTLER, F.L.S., F.Z.S., &c.

Whilst re-arranging the Museum collection of *Lithosiidæ*, in order to incorporate the Zeller and other collections, I have had occasion to look up the original figures and descriptions of all the European species. I have also found it necessary to examine separately every specimen placed by Prof. Zeller under each species, and I must say that I have been not a little surprised at the confusion which existed in the series of specimens associated under the various species by that eminent Lepidopterist.

In 1878 Mr. Moore made a critical examination of the structure of the *Lithosiidæ*, the result of which proved that nearly every British *Lithosia* belonged structurally to a distinct genus. In his revision of the Family he referred to his genus *Collita* the *L. griseola*, *L. complanula*, and *L. stramineola* of Europe; he does not, however, account for *L. complana*.

Lithosia complana is the true type of the genus *Lithosia*, and, so far as I know, it has hitherto been only distinguished from *L. complanula* = *lurideola* by a character so slight, that in the case of any other species of any other group, it would have been scorned universally as beneath notice, viz.:—

1—yellow costal stripe of equal width to hind margin .... *L. complana.*

2—costal stripe attenuated to a point at the tip .... *L. lurideola.*

Von Heinemann, however, adds that in *lurideola* the costa is evenly arched, the collar only yellow in front and at the sides, and the body and fore-wings are of a darker grey.

To attempt to follow the above distinctions has proved a hopeless task, not only to Prof. Zeller, but I believe to every one who has attempted to separate his species by them.

Following Mr. Moore, and accepting neuration as a guide in the separation of the European species, I find that *Collita lurideola*, *griseola*, var. *stramineola*, and its dwarfed form *cycladum*, Zeller, are characterized by very simple neuration, there being no false or post-discoidal cell in the primaries; in *Lithosia complana*, however, this cell is always present and usually very prominent, being visible in many specimens without the use of benzine.

With regard to colour characters, although all specimens of *C. lurideola* have the "costal stripe attenuated to a point at the tip," about half the specimens of *L. complana* in Prof. Zeller's collection (some of which were under each species) have the same character, whilst others are intermediate between the attenuated and non-attenuated types.

Neuration is not always strictly constant; but surely any structural character is more satisfactory than the extremely slight and variable colour distinctions hitherto pointed out for the separation of *L. complana* and *lurideola*.

British Museum:
July, 1887.

LIST OF BRITISH *TIPULIDÆ*, &c. ("DADDY-LONGLEGS"), WITH NOTES.

BY G. H. VERRALL, F.E.S.

(*Continued from Vol.* xxiii, *p.* 267).

L. APERTA, *n. sp.* (♂ ♀).—L. lineolellæ *simillima, sed pallidior et cellulâ discali apertâ.*

This species is exceedingly like the preceding, and may possibly be only a variety of it, yet there seem to be several small characters besides the conspicuous one of the open discal cell. It is smaller, the dark line on the thorax is less shining, smaller and shorter, the antennæ are lighter coloured, the femora are usually less black at their tips, the "great cross-vein" would be placed at about one-third the distance from the base of the discal cell, were that complete, while in *L. lineolella* it is at or beyond the middle, the forks of what should be the forked vein from the discal cell are from one and a half to two and a half times as long as their petiole, the mediastinal vein seems to end abruptly without any distinct cross-veins, but upon minute examination the sub-costal cross-vein can be faintly traced close to the end of the mediastinal, while the mediastinal vein itself ends faintly in the costa; the sub-costal vein seems to end in a somewhat similarly abrupt way just before the middle of the upper branch of the radial, but really it curves abruptly but evenly into the costa, while a faint marginal cross-vein unites it to the vein below. The end of the last abdominal segment of the male is deeply undulating at the side, while in *L. lineolella* it is nearly straight. One point in favour of this being a depauperated form of *L. lineolella* is that further absences of venation sometimes occur in it, one male in my possession having the upper third of the great cross-vein absent on one wing and very faint on the other, while sometimes the tip of the upper branch of the radial is obsolete.

It is not at all uncommon, and extends from the south coast to Sutherlandshire.

L. ferruginea, Mg.: always easily distinguished by the entire absence of any dark line on the middle of the thorax, and by the portion of the radial vein (after the præfurca but before the fork) being just about the same length as the upper branch of the fork. The abdomen of the male has a well-defined blackish fascia just before the end, which occupies nearly all the last two segments; on the edge of the last segment of the belly are tufts of stoutish reddish-yellow hairs. I have seen it in Hants, Sussex, Kent, Suffolk, and Sutherlandshire.

L. ochracea, Mg., is a common species, easily known by the character in the table; its distribution must be universal, as I have it amongst other places from Bonchurch, Inveran, Newmarket, and Bangor.

L. bicolor, Mg.: I caught this last June tolerably commonly about a hillside pond near Dolgelley. I have also seen it rarely in Hants and Sutherlandshire.

L. punctum, Mg.: I have seen but one British specimen of this, which I caught at Rannoch on June 25th, 1870.

At 18 in my table I must ask for a correction of a serious misprint; the whole second character should not occur here at all, but *is* in its proper place at 26, those, therefore, who are working from this table will oblige by striking out the last half of 18.

L. fuscipennis, Mg.: in this and the next species I cannot follow the recent continental writers: by *L. fuscipennis* I understand an entirely ochreous species, exactly as Meigen says, "glanzend ziegelroth, welches in der seiten ins Rostgelbe uebergeht." Schiner says, "Rückenschild obenant glanzend schwarz-braun," therefore he must mean some other species. He says, at the end of his description, that his species is identical with Schummel's and Zetterstedt's *L. discoidalis*; I suppose he means *L. discicollis*, my next species. I am convinced my next species is Zetterstedt's *L. discicollis*, but I am uncertain about its being Schiner's *L. fuscipennis*, because he says *L. fuscipennis* has the basal joint of the antennæ yellow, while in what he calls *L. discicollis* that joint is grey or blackish. Westhoff gives a good character for separating some of these species, but unfortunately I do not know which is the "upper" and which the "lower" third of the discal cell, I could understand "basal" and "apical," or "inner" and "outer," but the "upper" and "lower" thirds of an oblong are beyond me. My "glanzend ziegelroth" species has occurred in some abundance in a very small spot near Frant, also in Hampshire in two or three localities.

L. discicollis, Mg.: by this I mean a species with the peculiar venation given by *Meigen* (as in my table), and a shining dark brown disc of thorax with testaceous pleuræ. It is very common, and my most divergent localities are Slapton, Inchnadamph, Diss and Dolgelley.

L. subtincta, Ztt.: since my list was published Mr. Jenner has taken this species near Lewes from May 23rd to June 1st. It is most allied to *L. discicollis* and *fuscipennis*, having almost their venation; a handy character in *these three species* is that *the base of the second sub-marginal cell is at a right angle with the præfurca; L. subtincta*, however, differs a little, as the præfurca itself in my three specimens also starts at a right angle with the sub-costal vein, and has a recurrent veinlet. The character, however, most readily noticed is, that all the transverse veinlets and bases of cells are darkened. The great cross-vein is at or a slightly beyond the middle of the discal cell. The thorax is light brown with darker stripes, and the abdomen dark brown with yellowish incisures, the appendages being luteous.

L. lucorum, Mg., and *L. sepium*, Ver.: I have nothing to add to these species, except that *L. sepium* seems not uncommon in the south of England.

L. nemoralis, Mg.: very common, as I believe all the variations come back to one species, but yet the variations are so strong that I recommend the species to further study.

L. filata, Wlk.: this species is hopelessly unrecognisable from Walker's description, so I give a few extra characters, especially as I do not recognise in it any known continental species, although it is not uncommon in Great Britain.

It is a small blackish species with a narrow body and narrow wings, belonging to the group with a very short fork to the upper vein from the discal cell, in fact, in *L. filata* the *fork is often altogether absent* in one wing, and occasionally in both; the base of the discal cell is almost in a line with the two cells above it; the great cross-vein is sloping, and placed rather before the middle of the discal cell, the last vein is shortish and nearly straight. The frons is broad and hoary, the thorax slightly greyish-black, sometimes with three indefinite stripes, the "pits" shining black, and a spot on the middle near front of thorax conspicuous; the halteres are dirty whitish; the abdomen has some short yellowish hairs about the sides and on the blackish hypopygium; the legs are all blackish-brown, slightly tinged with luteous about the base of the femora. In the female the femora are rather paler.

It is somewhat common in the New Forest, and I have caught it in Kent and Sussex, and also at Loch Maree.

L. senilis, Hal.: this is another species which has been a great stumbling block, because Haliday has called it a *Dicranota*, with the 13-jointed antennæ of that genus. As a matter of fact it has the normal 16 joints. I can add but little to Haliday's remarks in Walker's "Insecta Britannica Diptera," iii, p. 307, because, as usual, Haliday has seized all the important characters; how he made the mistake about the antennæ puzzles me. The wings are broad and very pilose towards the tip, the end of the sub-costal vein is about the same as in Westwood's figure in Walker's book, only it is much less distinct, being almost lost in the large, indefinite, sub-coriaceous stigma; the discal cell is much broader at its end than at its base, the stem of the forked vein two and a half to four times as long as the wide open fork; the great cross-vein is after the middle of the discal cell; the spurs of the tibiæ are minute. It is not at all uncommon, I having often caught it in Hampshire, Sussex, Kent, and this summer in North Wales.

TRICHOCERA.

The species of "winter gnats" require more minute study from all parts of the world before any decided opinions can be given as to the distinctness of species. As a rule I have only caught them between September 18th and May 8th, but I caught one this year on June 16th at Bettws-y-coed.

AMALOPIS.

1 (2) Ochreous large species .... *littoralis*, Mg.
2 (1) Blackish or greyish species.
3 (4) Large species, with conspicuous marks on the wings ....*occulta*, Mg.
4 (3) Smaller species, with wings entirely without marks.
5 (6) Second sub-marginal cell much shorter than the first......*immaculata*, Mg.
6 (5) Second sub-marginal cell only a very little shorter than the first . *unicolor*, Schum.

I do not know *A. straminea*, Mg., except from Walker's type; he described from an ochreous *Amalopis*, of which I made the following note: "quite distinct from *A. littoralis*, no cross-vein between upper fork of radial and sub-costal, the upper vein from the discal cell has a slight petiole." I have a note also of a large *Amalopis* in the British Museum, labelled *transversa*, which is distinct from *A. occulta*, and I believe I have two or three undescribed species in my own collection, one of which was not uncommon in North Wales last June. I will, however, leave these for another occasion.

A. littoralis, Mg.: all the specimens I have seen have the slight cloudings of *A. tipulina*, Egger, which I am convinced is a synonym. I have seen it abundantly at many places, from Ivybridge to Inveran and Barmouth.

A. occulta, Mg.: I caught several on August 22nd last at Ivybridge, which is the only time I have met with it.

A. immaculata, Mg.: Osten-Sacken is quite right in sinking the genus *Tricyphona*; *A. immaculata* is common, though my notes only give Sussex, Hants, Suffolk and North Wales.

A. unicolor, Schum.: this was common at Rotherfield in Sussex on June 6th, 1886, but unfortunately I did not notice their being distinct from *A. immaculata*; however, I took seven, and they are abundantly distinct beyond the characters in the table by their slightly smaller size, thinner legs, which are only indefinitely yellowish near base of femora and on nearly all hind femora, but above all, the thorax in *A. unicolor* has four sharply marked narrow black lines, while in *A. immaculata* there is a broad central brownish-black line and two broadish side lines, none of them being very definite.

Phalacrocera replicata, L.: although I placed this among the "reputed" British species, I have since seen some specimens taken by Mr. Jenner at Lewes in, I believe, the very same locality as *Limnophila subtincta*. As a genus, it differs from *Cylindrotoma* chiefly by its *Tipula*-like colouring of brownish and greyish, while *Cylindrotoma* is like *Pachyrrhina*, yellow and black; individually it has a peculiar venation, figured by Osten-Sacken in his Monograph of North American *Tipulidæ*, p. 290. I am obliged to Mr. Jenner for giving me three specimens of this, as well as of *Limnophila subtincta*.

(*To be continued*).

White Butterflies.—In answer to the editorial request in the current No. of Ent. Mo. Mag. for data as to the limits in the South of England within which "Cabbage-Whites" have not been excessively abundant this summer, I may state that they have not been at all numerous hereabouts. On the contrary, they may be deemed rather *scarce*. In the neighbouring market towns, and in some of the villages, I have seen cabbage plants skeletonized; but elsewhere you may drive for miles without noticing a single butterfly of the kind, and in my own garden the larvæ have done scarcely any damage.—A. E. Eaton, Vicarage, Shepton Montague, Castle Cary: *September 3rd*, 1887.

[This is a useful piece of *negative* evidence, and goes strongly to prove that the presumed immigrants did not reach Somersetshire. The "skeletonizing" of cabbage plants in cottage gardens is of such general occurrence, always, as to require no further comment.—Eds.]

White Butterflies.—You ask for notes from the north on this subject. All three of the Common Whites have been in most unusual numbers here for the last two months. I noticed that some specimens of *napi* were very much worn and tattered. I did not examine any other species. In a garden in the heart of the town, where there were a large number of the butterflies on the wing, I examined the cabbages after reading your note. I failed to find a single larva either of *rapæ* or *brassicæ*. There were plenty of *Mamestra brassicæ*, but none of butterflies.—John E. Robson, Hartlepool: *September*, 1887.

White Butterflies.—I can corroborate, as far as this district of Roxburghshire is concerned, the unusual abundance of the two White Butterflies, *Pieris brassicæ* and *rapæ*, during July and August, but more especially during the last fortnight of the latter month. At that time a lawn here covered with the flowers of the autumnal hawkbit might be said to have been alive with them, for their pugnacious instincts kept them in a constant turmoil: the flowers appeared to be a great attraction, for they were continually settling upon them. In contrast to the abundance of *P. brassicæ* and *rapæ*, *napi* was almost a rarity. I may mention that last year *P. rapæ* appeared also in pretty strong force, although not to compare in numbers to this. Last autumn I collected from plants of *Brassica* in the garden about fifty full-grown larvæ of *P. rapæ*; about one-third of these pupated all right, but the others produced hundreds of the larvæ of the usual parasites, from which this summer they emerged in legion, and this appears to be one effectual means of keeping *P. rapæ* in check.—A. ELLIOT, Caverton, Roxburgh, N. B.: *September* 14*th*, 1887.

Migration of insects.—I am rather surprised to see in the Ent Mo. Mag. for September that the immigration of White Butterflies is strongly supported by several Entomologists. It seems to me that this idea, though, perhaps, occasionally correct, is somewhat overdone. If your readers had walked with me, say between Lewes and Eastbourne, on a day in September, 1886, I think they would not for a moment have doubted the possibility or probability of one raising a swarm of both *Pieris brassicæ* and *P. rapæ* for ourselves. Walls, &c., were covered with the larvæ, and the cabbages in the gardens were reduced to simple ribs. Considering the great fecundity of insects, it is, perhaps, surprising to us that so few reach the imago state until we begin to calculate the number of coincident circumstances necessary for that end and the great odds against it. Suppose, for instance, ten coincident favourable circumstances necessary for the perfection of every specimen of a brood—a very moderate calculation—it is probable that ordinarily only, perhaps, two or three of these favourable circumstances actually occur. In that case we see the insect in its usual or average state of abundance. Should only one circumstance be favourable—the others unfavourable or even neutral—the insect is rare. On the contrary, should eight, nine, or ten circumstances be all favourable, the insect far exceeds its usual numbers and swarms. What the particular circumstances are that influence the abundance or paucity of various species we but imperfectly know, but among them may be instanced absence or abundance of parasites, absence or presence in varying degrees of moisture, dryness, heat, cold, or storms at various critical periods, the direct or indirect action of man, &c., &c.

That partial migration caused by over-crowding and shortness of food takes place no one will deny, and this explains the occasional presence of great numbers on the sea coast, as every movement in that direction is stopped and the species becomes as it were heaped there. If there is an extra abundance of *Aphides*, or glow-worms, or the more sluggish *Coleoptera* which frequently happens, or even of the local species of *Lepidoptera*, no one thinks of flying to immigration for a cause, but considers at once that local conditions have produced it. Then why reason differently with other species?

Some years ago I saw *Colias Edusa* by dozens drying their wings in clover fields —evidently true British bred and born—yet all the while there was the usual talk of "immigration." If immigration is so potent a factor in producing our insect fauna, why do we not more often see the various strong flying butterflies and moths of neighbouring Europe which species may be numbered by scores?—J. H. A. JENNER, 4, East Street, Lewes: *September* 5*th*, 1887.

Deilephila euphorbiæ at King's Lynn.—My garden seems to be becoming a grand entomological locality. I went out at dusk this evening, net in hand, to watch for *S. convolvuli*, when I immediately saw a much smaller hawkmoth busily investigating the verbena blossoms. It was not timid, and was easily secured, and to our amazement proved to be that great rarity *Deilephila euphorbiæ*, as fine as though just emerged. It is, however, of a paler red-brown than some of the old Devonshire specimens. What can have brought it out into the imago state at this season of the year?—Chas. G. Barrett, King's Lynn: *September 7th*, 1887.

Eupithecia extensaria, Freyer, in Norfolk.—My eldest son, whilst collecting on the coast with Mr. Atmore, had the good fortune to meet with this exceedingly rare species. He was tapping the herbage as he walked along, when the moth flew out of a tuft of *Artemisia maritima*. They then commenced to work at this plant, and Mr. Atmore almost immediately secured another. They did not, however, continue at this rate, for the wind was rough and cold, and the insect exceedingly scarce, so that by careful working on successive days they obtained in all but nine specimens, one of which (a fine female) was sacrificed in a futile attempt to obtain eggs. I fear that ants got access to it, and devoured it.

I feel no doubt about the species, having (through Lord Walsingham's kindness) had an opportunity of seeing Freyer's original figure. It is a very handsome species, one of the largest of the *Eupitheciæ*, and, from its oblique stripes reminds one of a *Phibalapteryx*. It is whitish, with three straight grey-brown fasciæ parallel with the hind margin on the fore-wings, costa and hind margin clouded with grey-brown. There is a slight clouding on the hind-wings.

Eupithecia extensaria was first announced as British by the late Mr. Prest, of York, but the opinion was then expressed that the specimen was accidentally introduced from Russia. Subsequently Mr. Prest detected another specimen in the collection of one of the older entomologists of Hull, taken by him on wormwood at Spurn Point. These captures are noticed in the "Entomologist." No subsequent capture seems to be recorded.—Id.: *September 13th*, 1887.

A query as to the double broodedness of Orgyia antiqua.—This and other species are no doubt single or double brooded according to circumstances; but my observation this summer, and similar though less accurate observations at various times on other species, incline me to the opinion that many species are believed to be double brooded and to have "a succession of broods" without sufficient grounds. That they have "a succession of broods" is true, but the whole succession is, after all, only one brood.

I meant to rear *antiqua* this year in quantity for experimental purposes; but, finding I could not give the necessary time, turned out all but the earliest and latest larvæ. The warmth of June brought the earliest out very early, and ♀s were allowed to pair with wild ♂s which were then flying about the end of June. Eggs from these apparently fertile remain still unhatched, and intend obviously to hibernate. Other larvæ from the same broods did not become perfect insects till the middle of August, and would, if seen at large, no doubt, be regarded as a second brood. I have not seen any specimens at large for the last month, if there has been a second brood here this year it has still to emerge.—T. A. Chapman, Burghill, Hereford: *September 8th*, 1887.

Description of the larva and pupa of Nascia cilialis, Hb.—Seeing that it has excited the interest of so many entomologists resident near, or occasionally visiting, Wicken Fen, it is rather wonderful that this larva has not been described before in this Magazine. It has long been known on the Continent (Heinemann, Die Schmetterlinge Deutschlands, &c., Zweite Abtheilung, Band I, Heft ii, p. 68, 1865), and in this country to Lord Walsingham, the late Mr. Buckler (both of whom kindly gave me information about it), and to others, but I am not aware of its having been bred on this side of the water before the present year. The explanation of this is probably that during the day the larvæ crawl down deep into the herbage, so that they cannot be beaten into the tray, and that but a small proportion of the moths taken at light (the usual mode of capturing the imago) are females, while those that are taken do not lay readily, at any rate I have several times failed to obtain eggs. My own acquaintance with the larva is limited to that of three specimens, two of which I beat on successive days about the middle of September, 1882, at about 5.30 p.m., from a plant locally called Lisp, which I believe is otherwise known as *Carex riparia*. Believing in the "bird in the hand," I preserved these larvæ, greatly to the disgust of a brother entomologist. The third larva I received on October 1st, 1886, from Mr. Albert Houghton—it is the subject of this account.

In captivity it rested at full length on the under-side of a leaf of *Carex*, dropping rather readily by a silken thread when disturbed. It was sluggish, and crawled but slowly. When feeding it ate large pieces from the edges of the leaves. The head of the larva is prone, larger than the second segment, pale yellow, down the middle of it is continued the dorsal line, against this latter the lobes are edged with a faint red stripe, they have also a broad red-purple one down the middle, corresponding with the sub-dorsal line. The body is fusiform, thickest at the seventh and eighth segments. The dorsal line is olive-green, with a reddish tinge on the hind part of some of the central segments; it runs from the head to the tip of the flap, and is narrowly margined with sulphur-yellow. The sub-dorsal line is of a bright red-purple, and is continued from the sides of the head round the flap. The sides of the larva are bright yellow, most intense next the sub-dorsal line, gradually fading into the pale green of the ventral area. The warts are indistinct, of the same colour as the part on which they are situated; each bears a short black hair, four of which on the thirteenth segment are longer and more conspicuous than the rest. The spiracles are pale. The larva spent the winter in an opaque papery cocoon in an old reed stem, and pupated early in the second week in June. The moth (♀) emerged on June 22nd. The pupa measured 10 mm. by 2·5 mm. at the widest part. The head, thorax, limb cases and upper abdominal segments were nearly black, the posterior segments yellowish on the ventral aspect, shaded off into dark brown on the dorsal. The wing-cases were well marked, those of the posterior-wings projecting beyond those of the anterior. The antennal cases curve outwards at their tips round those of the wings. The thirteenth segment ends with a long, red, flattened, horny process, which bears eight hooked spines arranged in four pairs.—W. H. B. Fletcher, Fairlawn House, Worthing: *September 3rd*, 1887.

The larva of Nascia cilialis.—Of this larva Von Heinemann gives us the following information (*Zünsler*, p. 68):—

"Zincken found the larva in August on marsh-grasses in a moist alder-brake (now dry) near Brunswick." Von Heinemann describes the larva as "Lilac, with sulphur-yellow lateral stripe and belly, and with dark yellow-margined dorsal line," which is probably also from Zincken. I was much puzzled, at first, to conceive how Von Heinemann became possessed of this information of Zincken concerning this larva, as nothing about it can be found in any of Zincken's published writings, and Von Heinemann does not give any reference.

On reflection, and on comparing dates, however, I found that Zincken and Von Heinemann were both living in Brunswick for several years contemporaneously, though the latter was much the younger.

Zincken, or to give him his full name, Zincken *genannt* Sommer, whose period of greatest literary activity was between 1817 and 1821, was born (according to Hagen) in 1770, and resided at Brunswick, where he died February 8th, 1856.

Von Heinemann was also resident at Brunswick, his career as an Entomological writer commenced in 1848. In the Stett. Ent. Zeit. of 1851 and 1852 he began a list of *Lepidoptera*, found in the neighbourhood of Brunswick—compiled from the observations of Dr. Zincken and other friends, in addition to his own. This list, though evidently intended to have gone much further, stopped somewhat abruptly in the middle of the *Noctuæ*, in spite of a "(Forts. folgt.)"—but in the introduction to it (Stett. Ent. Zeit., 1851, p. 57) we are informed: "The correctness of the names amongst the *Micro-Lepidoptera* has been established by Herr Oberlehrer Zeller, in Glogau, those of the other *Lepidoptera*, where there was any doubt, by a comparison with the collection of Zincken-Sommer, and in all the species, found only by this last Entomologist by the use of his written notices."

Hence, no doubt these MS. notes of Zincken, when no longer required for the list, in which they were used in 1851 and 1852, were not lost sight of, but became incorporated in Von Heinemann's great work, "Die Schmetterlinge Deutschlands und der Schweiz," of which the first Volume appeared in 1859.*

In the Stett. Ent. Zeit., 1851, p. 61, we read of *Hesperia Steropes*, "found rarely by Zincken in July in a marshy alder-wood near Brunswick," which serves as a sample of the *written notes* of Dr. Zincken, which were utilized by the younger Brunswick entomologist, and possibly the same "marshy alder-wood" furnished him with the larva of *cilialis*. The date of its actual occurrence is nowhere given, but Von Heinemann first published the larva of this species in 1865, and, I believe, up to that time it was totally unknown to the scientific world. Even after its publication the notice seems to have attracted very little attention. Von Nolcken, who gave a long discussion on the synonymy of the species in the Stett. Ent. Zeit., 1869, pp. 272—275, makes no allusion to the larva being known, nor does he mention it in his *Lepidoptera* of Estland, Livland and Kurland, p. 308.—H. T. STAINTON, Mountsfield, Lewisham: *September* 12*th*, 1887.

A further note on Pancalia Leeuwenhoeckella.—As an addendum to my note (Ent. Mo. Mag., pp. 64-6), I may add that *Pancalia Leeuwenhoeckella* was abundant on the Chalk Downs near Strood, Kent, throughout the whole of June, and occurred well into the month of July. On the 21st of the latter month I netted some twenty specimens, but they were in such a wasted condition that they were worthless for cabinet specimens, and hence I did not set them out. As I did not visit the district again until August 19th, I had no opportunity of observing when it finally disappeared.—J. W. Tutt, Rayleigh Villa, Westcombe Park, S.E.: *August*, 1887.

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* Unfortunately Von Heinemann did not live to complete this work, but after his death in December, 1871, it was happily brought to a conclusion by Dr. Wocke, of Breslau, the final volume bearing date 1877—seven years after the appearance of its immediate predecessor.

Gelechia semidecandrella in Norfolk.—Looking over my series of *Gelechia marmorea* last winter, I was rather surprised to find two specimens of the recently described *G. semidecandrella.* These specimens I had previously overlooked, believing them to be merely a form of the commoner insect; but there is no doubt that I took them two or three years ago at Hunstanton, where the species has again occurred this year. It has also been observed on the Merton estate.—Edward A. Atmore, King's Lynn: *September 15th*, 1887.

Adela cuprella at King's Lynn.—Late in the afternoon of May 8th this year I captured near this town four fine specimens of this local species at rest on sallow bloom. During the next few days I again searched the same bush and others near it, but failed to secure another specimen. The occurrence of this beautiful insect in Norfolk has not been hitherto recorded.—Id.

Melissoblaptes cephalonica at King's Lynn.—Whilst looking for *Plodia interpunctella* and *Gelechia cerealella* on the premises of the King's Lynn Dock Company, I was pleased to find two specimens of this Lepidopteron sitting on the outside of one of the warehouses. A search inside the warehouses did not result, as I had expected, in the discovery of more specimens, although imported grain of various kinds and in large quantity was stored therein. For the last three or four years I have been on the look out for whatever might turn up of interest in the neighbourhood of our Docks, but have never noticed the species there before. Probably it is a fresh arrival here. Both this and the last two species are additions to the Lepidopterous fauna of Norfolk.—Id.

Acidalia promutata and Melanthia ocellata double brooded this season in Norfolk.—Perhaps the appearance of second broods of these insects this season may be worth noting. I first observed a specimen of *M. ocellata* in this district on May 30th, and during June specimens of this common insect were, as usual, of frequent occurrence. A few stragglers in worn condition continued to occur throughout the first half of July, and no more were then seen for some weeks. However, I was much surprised to find the species again putting in an appearance in splendid condition, and of average size, at the end of August and beginning of the present month (September). The appearance of this species in fine condition at so late a period in the year must surely indicate the existence this season of two broods in this part of Norfolk.

Acidalia promutata.—A single specimen of this species was taken here on June 18th. No more were seen until the 2nd of the present month (September), when I captured a specimen in splendid condition at light; another equally fine was taken on the 4th. From close observation I am able to state that this species is not normally double brooded here; that it has been so this season there can be, I think, no doubt.—Id.

The urticating properties of certain larvæ.—My own experience may help to elucidate this matter. A short time ago I was handling the cocoons of a certain species of *Bombyx*, and soon afterwards experienced the most painful itching in my fingers. On examination I found the cocoons everywhere covered with the short—in many cases minute—stubly hairs which covered the larva previous to its finally casting its skin. These made their way beneath the epidermis of the fingers and there remained perfectly visible for some days; the least pressure on the part causing the same irritation, and evidently due to the mechanical irritation of the hairs on the sensitive papillæ of the skin. I am rather of opinion that this explanation holds good in every case; the urticating properties being always more marked when the hairs are old and easily detached, at a time when the formic-acid secreting glands—if such there be—at the bases of the hairs would presumably be less active or probably inert.—N. MANDERS, Fort Stedman, Shan States, Birmah: *June* 15*th*, 1887.

[There appear to be two distinct kinds of urtication produced by the hairs of Lepidopterous larvæ. In one, and possibly the most frequent, it is, no doubt, purely mechanical; in the other a poisonous fluid is secreted by special glands and is carried up the tubular hairs.—EDS.]

Apatania fimbriata, Pict., a caddis-fly new to the British Isles.—At the beginning of August I had the pleasure of spending a week with my friend Mr. J. J. King, at Killarney. As Mr. King resided the best part of the summer there, he will no doubt in due time give a particular account of his work in a most interesting district; but, in the meantime, I desire to record the capture of a species of *Trichoptera* new to the British Isles, and perhaps to be placed with *Saxifraga umbrosa* and *Arbutus unedo* amongst things exclusively Irish.

On the 3rd we made an excursion to the Gap of Dunloe, chiefly with the object of collecting at the series of lakes situated in that well-known Pass. At the lower end of the Black Lake, not far from the point where the river leaves it, we took single specimens of an *Apatania* which appears to be *A. fimbriata*, Pict., and on the same day at the head of the Anger Lake we got a few more examples. These captures led us to revisit the locality on the 5th, when, at the last-named lake, we discovered the insect's head quarters, and took it in considerable numbers. On our way to the Horses' Glen the following day, it again turned up at Lough Garagarry; it was apparently common, but a drenching mist rolled down on us from Mangerton almost as soon as we had begun collecting, and drove us home. Mr. King tells me that after I left the district, he found it at other lakes commoner than ever, and I think it may be assumed that the species occurs in suitable localities all over the mountainous south-west corner of Ireland.

On the Continent the species inhabits the mountains of the central region. Mr. McLachlan informs me that he has always found it about *weedy streams*. In Ireland it occurred at spots where the margins of the lakes were lined with huge blocks of rock, and we took it at rest on, or flying amongst, the rocks, and by sweeping the herbage on the banks. Usually at such places the only aquatic vegetation was a scattered growth of the pretty *Lobelia Dortmanna*.—KENNETH J. MORTON, Carluke, N.B.: *September* 16*th*, 1887.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY: *August 25th*, 1887: R. ADKIN, Esq., F.E.S., President, in the Chair.

Mr. Cooper exhibited *Argyrolepia æneana*, Hb., from Essex. Mr. Mera, examples of the summer emergence of *Tephrosia crepuscularia*, Hb. Mr. West, bred *Acidalia ornata*, Scop. Mr. Sheldon, *Catoptria candidulana*, Nolck, *Retinia buoliana*, Schiff., and *R. pinicolana*, Dbl. Mr. Wellman, *Agrotis cursoria*, Bork., from Burton-on-Trent, *Noctua festiva*, Hb., var. *conflua*, Tr., from Perth, and *Plusia chryson*, Esp., from Newmarket. Mr. Dobson, *Psilura monacha*, L., *Selenia tetralunaria*, Hufn., *Eugonia erosaria*, Bork., *Amphipyra pyramidea*, L., &c., bred from larvæ obtained at the New Forest. Mr. Barron, a large specimen of *Polyommatus Phlæas*, L., with broad border to fore-wings. Mr. Tugwell, *Boarmia abietaria*, Hb., bred from larvæ beaten out of yew. Mr. Tutt, a *Gelechia* of doubtful species, a short series each of *Depressaria Yeatiana*, Fb., *Doryphora palustrella*, Dougl., *Crambus contaminellus*, Hb., *C. alpinellus*, Hb., dark forms of *Lita marmorea*, Haw., and a new species, *Lita blandulella*, also a blackish *Depressaria*, which Mr. Tutt stated could not be identified as belonging to any of our known British species. Mr. Sabine, *Lycæna Icarus*, Rott., males of varying blue tints, blue females, and a dwarf male barely three-fourths of an inch in span, under-side with confluent spots; an under-side of male with left wings normal and right wings of the obsolete type; also males of *L. bellargus*, Rott., of various shades of colour, and females more or less blue; a fine series of *hybrids* (?), male and female between *Icarus* and *bellargus*; and forms and varieties of *L. Corydon*, Hb. Mr. Billups read a letter from Mr. Cockerell giving notes on the fauna of West Cliff, Colorado, and exhibited specimens of *Lepidoptera* from that district.

September 8th, 1887: T. R. BILLUPS, Esq., F.E.S., in the Chair.

Mr. J. T. Williams exhibited a small specimen of *Drepana binaria*, Schiff., and remarked on the number of dwarfed specimens of *Lepidoptera* noticed this year, which he attributed to the drought. A discussion ensued, in which Messrs. Billups, Carrington, Wellman, and others took part; Mr. Williams also showed a specimen of *Sphinx convolvuli*, L., taken on his bedroom window at Crayford. Mr. Sheldon exhibited long series of *Agrotis agathina*, Dup., and *Noctua castanea*, Esp., taken on heather flowers at Shirley. Dr. Rendall, *Apamea gemina*, Hb., and *Hadena dissimilis*, Knoch, and contributed notes. Mr. Wellman, varieties of *Zygæna filipendulæ*, L., from Dover. Mr. Dobson, *Emmelesia albulata*, Schiff., var. *thules*, Weir, and various *Tortrices* from the Shetland Isles. Mr. E. Joy, two melanic varieties of *Vanessa urticæ*, L., bred from larvæ found at Folkestone. Mr. Tutt, varieties of *Agrotis tritici*, L., taken at Deal in 1887. Mr. Carrington, pupæ of *Dicranura vinula*, L., formed among cotton wool. Mr. Billups stated that several larvæ of this species had been found in the churchyard of St. Saviour's, Southwark. Mr. West (Greenwich), *Rhantus pulverosus*, Steph., *R. notatus*, Berg., the red variety of *Agabus bipustulatus*, L., and *Philonthus punctus*, Gr., all from Erith. Mr. Carrington, specimens of the Hessian fly, *Cecidomyia destructor*, and a discussion took place as to the probability of this insect becoming permanently established in this country. Mr. Billups exhibited, on behalf of Mr. Cockerell, species of various Orders from Colorado.—H. W. BARKER, *Hon. Sec.*

ENTOMOLOGICAL SOCIETY OF LONDON: *Sept. 7th*, 1887.—Dr. DAVID SHARP, F.Z.S., President, in the Chair.

Mr. Arthur Sidgwick, M.A., Fellow of Corpus Christi College, Oxford, of Woodstock Road, Oxford, was elected a Fellow of the Society.

Mr. Jenner Weir exhibited a living larva of *Myrmeleon europæus*, which he had taken at Fontainebleau on the 6th August last.

Mr. Elisha exhibited a series of bred specimens of both sexes of *Zelleria hepariella*, Stn.; and also, on behalf of Mr. C. S. Gregson, a series of eighty varieties of *Abraxas grossulariata*, selected from the specimens bred during the year 1886, from 4000 larvæ obtained from eggs laid by selected varieties, the result of crossing and interbreeding for more than twenty years.

Mr. Stainton remarked that the female of *Zelleria hepariella* had until lately been considered a distinct species, and was known as *Zelleria insignipennella*, but Mr. Elisha had proved the specific identity.

Mr. Tutt exhibited specimens of *Crambus alpinellus*, *C. contaminellus*, *Lita semidecandrella*, *L. marmorea* (dark forms), and *L. blandulella* (a new species), *Doryphora palustrella*, and *Depressaria Yeatiana*, all collected at Deal during last July and August.

Mr. Stainton observed that *Crambus alpinellus* was so named from the earliest captures of the species having been made on the lower parts of the Alps, but that it had since been found on the low sandy ground of North Germany, and its capture at Deal quite agreed with what was now known of the distribution of the species in Germany. It was first recorded as a British species by Dr. Knaggs in 1871, from two specimens taken at Southsea by Mr. Moncreaff. Mr. Stainton further observed that he had named Mr. Tutt's new species *blandulella* from its similarity to a small *maculea*, of which one of the best known synonyms was *blandella*. He also remarked that Deal was a new locality for *Doryphora palustrella*, which had hitherto only been recorded from Wicken Fen and the Norfolk Fens in England, and from the neighbourhood of Stettin on the Continent.

Mr. Waterhouse exhibited, on behalf of Mr. Coote, a variety of *Lycæna Phlæas*; also a number of *Stenobothrus rufipes*, and three specimens of *Coccinella labilis*, recently taken at Herne Bay.

Mr. Martin Jacoby exhibited specimens of *Spilopyra sumptuosa*, Baly, and *Sybriacus magnificus*, Baly. He also exhibited several species of *Galerucidæ*, belonging to a genus which he proposed to call *Neobrotica*, closely resembling in shape and coloration certain species of *Diabrotica*, but differing therefrom in structural characters. He remarked that the late Baron Von Harold had described a *Galeruca* from Africa, which, except in generic characters, exactly resembled the South American genus *Dircema*.

Dr. Sharp communicated a paper, by Mr. Thomas L. Casey, "On a new genus of African *Pselaphidæ*."

Mr. Bridgman communicated a paper entitled "Further Additions to the Rev. T. A. Marshall's Catalogue of British *Ichneumonidæ*."

Mr. Distant read a paper entitled "Contributions to a Knowledge of Oriental *Rhynchota*."

Mr. Enock read notes "On the Parasites of the Hessian Fly," and exhibited specimens of injured barley. A discussion ensued, in which Dr. Sharp, Mr. Jacoby, Mr. Billups, Mr. Waterhouse, and others took part.—H. GOSS, *Hon. Secretary*.

LIFE-HISTORY OF *SCOPULA DECREPITALIS.*

BY G. T. PORRITT, F.L.S.

We are indebted to Dr. T. A. Chapman, of Burghill, Hereford, for the discovery of the larva of this species. In June, last year, Dr. Chapman captured specimens of the moth in Scotland, flying among *Asplenium filix-fœmina* and *Lastrea spinulosa*, and from some of the ♀ was fortunate enough to obtain eggs. These duly hatched, and after seeing that the young larvæ fed and were making satisfactory progress, Dr. Chapman most kindly shared them with myself, Mr. Jeffrey, and, I believe, also the late Rev. J. Hellins. Those entrusted to my care fed on well, but, unfortunately, they apparently reached full growth during my absence from home, and evidently from mismanagement at this time, on my return I found some of them dead, and the others nearly so, having probably been drowned by the excess of moisture which had accumulated inside their glass, in their wanderings to find suitable places in which to spin up. Some of Dr. Chapman's and Mr. Jeffrey's larvæ did spin up, but the imagos not emerging in the early summer, it was found the larvæ had died without changing to pupæ. At the end of last month (August) Dr. Chapman was again in Scotland, and after a long search managed to find three larvæ in slightly spun webs under leaves of *L. spinulosa*, exactly in the position he expected to find them, and on the fern which he had become convinced was really the natural food.

Dr. Chapman and Mr. Jeffrey each took notes with a view to publishing the history of the species; but as they have both expressed the wish that I should do the writing of it, I have undertaken to do so; although as Dr. Chapman really knows so much more about the species than any of us, I was most anxious that it should come from his pen, in preference to my own. He very kindly placed his notes in my hands to be incorporated with my own, and as I find he has noted some details I had omitted, such as the position of the hairs, &c., besides giving description of the egg, and the first stages of the larvæ, the history is thereby rendered much more complete than would otherwise have been the case.

The eggs were laid about June 20th, on leaves of *Teucrium scorodonia*, and Dr. Chapman described them as

> Amorphous-looking objects, nearly colourless, flat, and approximately round, fitting accurately into the grooves and roughnesses of the leaves of the *Teucrium*, as if at the time of laying they had been fluid, and really not looking very solid still. The surface is not, however, smooth, but faintly and irregularly rough and shagreened.

They became more white and opaque when towards hatching, and the black eye spots of the included larvæ could sometimes be detected. They hatched July 3rd. The newly emerged larvæ are colourless or whitish, very transparent, with very black eye spots, and faintly brown jaw tips; the hairs are long, as long as the diameter of the body, and directed forwards and backwards, but the disposition of the tubercles could not be ascertained, owing to the uniform colourlessness of the larvæ, they seemed to be of the usual pattern, with one bristle each.

The first moult occurred July 7th. It makes no change in the aspect of the larva, which has, however, a greenish tint from the time it begins feeding, from the intestinal contents.

The second moult occurred about July 11th, and again produced little change in the appearance of the larva. When about to moult, the eye spots present a curious aspect as black spots on the second segment. The disposition of the tubercles and hairs can now be determined with some difficulty; the dorsal tubercles are placed nearly squarely rather than in the usual trapezoidal manner; the bristles of the anterior pair are directed forwards and inwards, of the posterior backwards and outwards, and of the lateral, or super spiracular, forwards and downwards; all looking depressed to the larva instead of standing off perpendicularly to the surface.

The third moult occurred about the 15th, one as late as the 18th July.

My larvæ reached me on July 17th, and were then about a quarter of an inch long, transparent, pale yellow, but the dark green alimentary canal, with the green internal organs generally, gave it a strong green appearance; head very pale yellow, tinged with pink; eye spots black, jaws pale brown.

The fourth moult occurred July 20th.

By July 28th, a length of about five-eighths of an inch had been attained: slender, and of nearly uniform width; skin of the same glossy transparent texture as before. The dorsal, sub-dorsal, and lateral tubercles are raised bosses, surrounded by radiating lines or plaits which encroach on the dorsal bosses, but not on the subdorsal; in some respects the tubercles from these plaits remind one of the summit of a *Noctua* egg; the hairs of the anterior pair of dorsal tubercles are directed forwards and inwards, of the others outwards and a little backwards; the tubercles of the third and fourth segments are same as the others, but the second pairs are very small; the sub-spiracular tubercle is a compound one of some length, and carries two bristles, one directed forwards, and one backwards, both rather downwards.

Ground-colour pale yellow, but the very conspicuous dark green alimentary vessel showing through, together with the green internal organs along the sides, still form the prevailing colour of the dorsal area: the dorsal stripe is broadly bordered on each side with pale greenish-white; spiracles black; head pale yellow, with blackish ocelli, and brown mandibles, as before.

When about to moult, from abstinence from food, the dark green colouring is lost, and the larva appears almost uniformly bright pale yellow.

On and about July 31st, they were moulting for the last time, and on August 5th I described them as follows:—

Length, five-eighths to three-quarters of an inch, and rather slender; head polished, rather broader than the second, but about the same width as the third segment; body cylindrical, and of almost uniform width throughout its entire length; skin semitranslucent.

Ground-colour pale yellow, but the green internal parts at first sight make it appear to be of that colour; head pale straw colour, mandibles brown, and the ocelli still darker brown; dorsal stripe a median shade of green, edged on each side with a broad whitish stripe; sub-dorsal stripes also of the same green colour, followed by a pale whitish line above the spiracles, and then by a waved whitish stripe along the spiracular region. Ventral surface, legs, and prolegs of the same median shade of green as the stripes of the dorsal area. Dr. Chapman says the prolegs are terminated by a circlet of two very fine hooks, though on the anal prolegs one side of the circlet is hardly developed; anterior-legs terminated by a very fine brown claw.

After ceasing to feed, and before spinning up, the colour (as is the case with others in the genus) changed considerably. The ground became bright brownish-yellow, and the dorsal stripe still browner, and the former whitish stripes lemon-yellow; the green colouring of the earlier stages had entirely disappeared, clearly showing it was caused solely by food in process of digestion.

Dr. Chapman's larvæ spun strong silken cocoons, in which doubtless the winter is spent, the change to pupa taking place in spring. Throughout life, when not feeding, the larva lives under a slight web spun over itself; and when about to moult, a much firmer domicile, almost a cocoon, indeed, is formed, so much so that in one or two instances Dr. Chapman suspected they had reached a stage at which they naturally enclosed themselves for hibernation.

Dr. Chapman, by his captures of the larvæ this year, has proved the natural food to be, as indeed he was quite sure it was, *L. spinulosa*.

Huddersfield: *September* 28*th*, 1887.

NOTES ON BRITISH *HYMENOPTERA*.

BY EDWARD SAUNDERS, F.L.S.

CRABRO PALMIPES AND VARIUS.

In my Synopsis of British *Hymenoptera* (Trans. Ent. Soc., 1880, p. 288), I have given as the chief differential character of the females of these species the colour of the anterior calcaria—those of *varius* as being pale, those of *palmipes* dark. This character, however, does not seem to be a reliable one, although Wesmael appears to have found it so, as he says, in his "Revue Critique des Hym. Fouisseurs de Belgique," p. 135, under *palmipes*, "Le plupart des auteurs ont confondu la femelle avec celle du *C. varius*. Un seul caractère suffirait cependant pour la distinguer facilement; c'est que *l'éperon des jambes de devant* *est noir*, comme chez le mâle, tandis que chez le *C. varius* cet éperon est *jaune* dans les deux sexes."

Mr. R. C. L. Perkins first called my attention to this, as in a series of specimens which he took of *palmipes* (♂ ♀) this year the females had the front calcaria pale. I am, therefore, anxious to point out that this character, like most other colour characters, can not be trusted. Another distinguishing mark is said by Wesmael to be the yellow spot on the scutellum of *varius* ♀, which never occurs in *palmipes* ♀. I have, however, a *varius* ♀ with that spot so small that I have little doubt that a spotless variety must occur. Under these circumstances I think the only safe distinctions to rely upon are the following, also pointed out by Wesmael, viz., the deeper, wider metathoracic sulcatures of *palmipes*, and consequently the rather more restricted areas enclosed by them, the rather wider joints of its front tarsi, the basal one being slightly bent at the base, and the more prominent spines on the sides of the mesopectus. Still the two species are exceedingly closely allied, and the characters are nearly all characters of degree (unfortunately neither species is very common), but I should very much suspect that long series would contain some intermediate forms.

ANDRENA VARIANS, Rossi, HELVOLA, Linn., and FUCATA, Sm.

These three so-called species have always been more or less of a difficulty to Entomologists. In my Synopsis of our British *Hymenoptera* I tried to give distinguishing characters to each, and I hoped I had succeeded; but information which I have gleaned this season has considerably upset the conclusions which I then arrived at.

During the spring of this year I was at St. Leonard's, and on April 23rd met with a large colony of *A. varians*, so that I was able to study that species pretty carefully. The specimens which I found were in lovely condition, and I was able in several cases to dig both sexes out of the same hole, so that no reasonable doubt could exist as to their belonging to the same species. I was surprised, however, to find that the females hardly varied at all, all having only black hairs on the face and abdomen, and none of them showing any tendency towards the pale hairing of *helvola*, and that the males were all of the large headed form, with simple mandibles, which in my Synopsis is referred to *helvola*. This experience of mine exactly corresponds with that of Mr. R. C. L. Perkins, who has taken *varians* at Oxford this spring; all his females he tells me "are true *varians* with dark face, the males all simple mandibled and quadrate headed." I am, therefore, quite satisfied that the ♂ of my *varians* must be transferred to *helvola*, and that of my *helvola* to *varians*; also that *varians* is not a very variable species, and is easily distinguishable by the quadrate vertex of the head and simple mandibles of the ♂, and by the black-haired face and abdomen of the ♀.

Having thus (at least, to my own satisfaction) disposed of *varians*, fresh difficulties, and much greater ones, arise in attempting to find distinctive characters whereby to separate *helvola* from *fucata*. I have very seldom met with either, but here again I am very glad to be able to profit by Mr. Perkins' experience. He takes *helvola* at Oxford, and remarks that it does not appear till a fortnight or three weeks after *varians*, this year appearing about the 25th May, and frequenting May blossoms; he has also taken it on *Crepis*. At the same time of year he takes *fucata*, and from the series he has sent me for examination, I feel convinced that there are no characters to be relied upon of specific value whereby to distinguish them apart; the colour of the pubescence on the legs and abdomen varies greatly, and Mr. Perkins tells me that he has always taken the ♂ (which I have described as *varians* in my Synopsis, and which I now refer to *helvola*) in company with typical *fucata*, having on one occasion taken ♂ and ♀ in the same flower.

I am, therefore, at present disposed to amend my synonymy of these three forms thus—

varians, Rossi, Thoms., &c.
= *helvola* ♂, Smith, 1st ed., E. S., Synopsis.
helvola, Linn., Thoms., &c.
= *varians* ♂, Smith, 1st ed., E. S., Synopsis.
var. = *fucata*, Sm.
clypearis, Nyl.

St. Ann's, Mount Hermon, Woking:
September 29*th*, 1887.

OCCURRENCE OF *LOZOTÆNIA (CACŒCIA*, HB.) *DECRETANA*, TR., IN NORFOLK.

BY W. WARREN, F.E.S.

Towards the end of last month, I spent a few hours in King's Lynn, and while looking over Mr. Atmore's late captures, observed a pair of this species, with which he has it seems been acquainted four or five years, but has passed it by as a pale form of *Podana (fulvana*, Stn.). A ♂ specimen, caught in a previous year and placed among his *Podana*, he kindly gave me. It is not improbable that Mr. C. G. Barrett, who has this year worked the same neighbourhood, may find himself the fortunate possessor of a few examples of this pretty species. Though much resembling its commoner relative, *Podana*, it may be at once distinguished by the apices of the hind-wings, which in the ♂ are broadly whitish-ochreous, in the ♀ pale yellowish, whereas both sexes of *Podana* have them orange.

In the f. w. the ♀ of *decretana* is very much like *Podana*, but the ground-colour is rather paler, and the fringes at the apex are *not* dark brown. Of the ♂ the ground-colour is pinkish-grey, tinged with ochreous, but always without the dark brown-black tints of *Podana*, and the markings, which are pale reddish-brown, are far more clearly defined. Instead of the patch of white scales from the base, *decretana* has a streak of pale yellowish-grey scales. The basal patch is represented by an oblique brown blotch on the inner margin, from the tip of which a fine brown line runs obliquely backwards to the costa. The central fascia is clearly defined, and edged with a faintly lustrous line throughout towards the base, but externally near the costa only; towards the inner margin it becomes indeterminate. Its inside edge is strongly concave in the centre of the wing, so that the fascia itself is almost interrupted. The costal spot is large, triangular, with undefined margins, and is not produced towards the anal angle.

According to Heinemann, the species occurs in Saxony, Silesia, and Baden, but is not common. It is figured by F. R., tab. 44, fig. 2. Mr. Atmore tells me that it is distinguished by its very wild and strong flight, and that it is very local.

Fischer von Röslerstamm states that at Glogau it was taken amongst *birch*, and that it was bred for some years by von Tischer at Dresden, though in this case he does not state from what food-plant.

Merton Cottage, Cambridge:
September 25th, 1887.

THE LARVA OF *BATRACHEDRA PINICOLELLA*.

BY J. H. WOOD, M.B.

It is difficult to understand why this larva should have remained so long undiscovered, as there is nothing particularly mysterious in its habits. One circumstance, perhaps, has had much to do with the oversight, viz., the impression that the insect was connected with Scotch fir, whereas its food-plant is the spruce (*Abies excelsa*), upon the needles of which the larva feeds.

The larva hatches out in the autumn, hibernates small, begins to feed again in the spring, and becomes full-fed towards the end of May. For a short time after leaving the egg, it lives inside a needle, but afterwards for the rest of its life it occupies, like its congener, *præangusta*, a gallery, that it spins on the surface of a twig. This gallery is of a brown colour, close texture, and even regular form, but in time it gets so covered up by the accumulation of frass that it comes to bear a rough resemblance to the loose, untidy, habitations of *Coccyx hercyniana* and *nanana*. *B. pinicolella*, however, always hides within its gallery, and usually eats out the leaves for only half their length; the *Tortrices*, on the other hand, as invariably hide within an excavated needle, and in feeding clean out each needle thoroughly before attacking a fresh one. When full-fed, it spins on the underside of the same or an adjoining twig a slender, somewhat flattened, brown cocoon, with rounded ends, and rather wider at one extremity than the other; the general appearance being strikingly like the larval gallery before it acquires its covering of frass.

The larva in its first skin is yellowish-brown, with black head and thoracic plate, and rather long and conspicuous hairs. It then moults and acquires the form and characters which it retains without appreciable change to the end, so that the following description will stand for any stage in its subsequent development:—

Rather slender, not attenuated, cylindrical, with the divisions deeply cut. Segments, when viewed from above, flat-sided, not rounded, and with a transverse wrinkle across the back of each. Colour, reddish-brown. Head black and shining. Thoracic plate black, with a white colour in front. Anal plate not noticeable. Hairs pale and inconspicuous. The pupa is long and slender, the limb-cases reaching nearly to the end of the abdomen, and being free at their tips for about the breadth of a segment. Colour, a pale dull brown, with a green tinge in the wing-cases.

Tarrington, Ledbury:
October 4th, 1887.

AN ENTOMOLOGICAL RAMBLE AT BERGEN, NORWAY, AUGUST 20TH, 1887.

BY ROBERT C. R. JORDAN, M.D.

It was a glorious day, very warm, and the sun shining very brightly, so taking a net with me, I walked towards the Flöien, to see what might be found in the way of Lepidopterous life in rather a high latitude.

The first moth seen was *Ortholitha limitata* (*chenopodiata*), of which three or four were disturbed from the grass and *Centaurea* by the road-side: these were light specimens, but not much more so than often happens Then occurred *Pterophorus fuscodactylus*, two only seen, and one only caught; and here I may make a digression to state that I have taken many "plumes" in Norway in this and a previous excursion, they are: *gonodactylus*, Christiania; *ochrodactylus*, amongst *Achillæa millefolium*, both at Christiania and Hamar; *Fischeri*, Throndjem and Lille Elvdal; *cosmodactylus*, woods at Koppang; *fuscodactylus*, Bergen; *tephradactylus*, Eidsvold, amongst *Solidago*.

But to return, my next moth was *Larentia didymata*, of which, during the day, I saw hundreds; I shall have more to say of this by and by. My first butterfly now appeared, it was *Vanessa urticæ* settled on a hawk-weed near me, a splendid specimen, small and clearly enough of the dark northern form, *polaris*; I did not take it, for I had not yet mounted my net, not having left the carriage-road; curiously enough, before leaving home, I had seen two laid up for hibernation, although the weather was at that time intensely hot; yet, here was one enjoying the sunshine; that they do live through the intense cold of a northern winter was proved by the fact that when at Jerkin, on the Dovrefjeld, in July, 1885, I used to see an old veteran in one spot every day, his feathers were few, but his life seemed happy; so also at Stören I saw *Vanessa comma*, evidently a hibernated specimen: clearly my present friend intended to delay his winter sleep awhile. Leaving the carriage-road, I followed the footpath to the Flöien, which is an eminence above Bergen, that may be likened to Arthur's Seat, and another butterfly appeared, *Erebia Blandina*, ♀. She was a very bad specimen, but yet unwilling to be made a martyr to science, for as my net was being mounted she made her escape: this was a very sunny, warm spot, the cliff reflecting the sun's rays; and I saw another butterfly, *Chionobas Jutta*, it settled on a slab of rock as usual, and my net was put fairly over it, but no rock is quite level, and it escaped by the side, and was no more seen. This butterfly was taken by me at Jerkin, in 1885, and its habit was a curious contrast to the swift-flying *C. Aello* of the Alps. *C. Jutta* when pursued never flew far, but doubled, and tried to avoid observation by settling with closed wings on a rock, and I have lost more than one before, just as I lost the present specimen; though I lingered at this warm nook, no more butterflies appeared; and the only peculiar being which came was a fine fieldfare, seeming to me somewhat strange in August. I went onwards, and upwards, and now *Cidaria populata* began to be commonly seen asleep on the under-side of the bilberry leaves and branches, sometimes making a mistake and settling on *Cornus suecica* instead. One bad specimen of *Ablabia pratana* was also caught; some of the specimens of *C. populata* were dark, like the Rannoch ones, others the usual colour, but all large. The pole which marks the summit was soon gained, but this is not the place to speak of the wondrous way in which the city of Bergen lies spread out as in a map beneath your feet, or how the islands and inlets make the sea beyond look like so many blue lakes hemmed in by low mountain ranges. I left the Flöien and wandered on over a region of heather, cotton grass, and stunted juniper, with very few plants that are not seen in Alpine regions in England or Scotland; the sun was shining brightly, but no butterflies; as I passed on, *didymata* ceased to be common, and *Larentia cæsiata* took its place; my first halting place was a little mountain tarn called Skomager-diket, and here I sat for a little time trying to catch an *Æschna*, which haunted the lake, but would keep out of reach: midges, however, came too close; at last, I went off over the mountains to Blaamanden, and enjoyed the views and the desolate wildness immensely, but for hours I saw no human being, no bird, no animal; true there were a few frogs, and of insects there was *Bombus lapponicus* humming amongst the heather, plenty of *Eristalis* of different species, and *cæsiata* flying from the boulders as you passed them, yet the solitude was very great, and the absence of life wonderful.

On my return home, nothing new was noticed until I came to the sunny sheltered spot before mentioned, when *Erebia Blandina* was again seen flying down the cliff-side beneath me, as also one *Pararge Hiera*, a small dark and beautiful specimen, this I took, and also one ♂ *Lycæna Icarus*, very bright, large, and fine. Shortly after, *Simäethis Fabriciana* was caught, and a small *Tinea* seen, but lost; the tortoiseshell was still flying about in his old haunt, but I did not attempt to take him. *Larentia didymata* was in plenty: I saw hundreds, but what struck me as a remarkable change in habit, was that it is here evidently a day-flying insect, the ♂s especially so, indeed, I saw no ♀s on the wing, they were at rest, or *in copulâ*, but the males were hovering and searching about the herbage in great activity and great numbers; as far as my observation goes in England, it is like other *Geometræ*, a moth of the twilight: but here it is a lover of the afternoon sunshine—and this is the result of three afternoon's investigation. It is curious to speculate upon the different habits of the three *Geometræ* to-day noticed in plenty; *L. didymata*, awake in the sunshine and enjoying its life in it; *populata*, sleeping so soundly that I could box any that were found and wanted; *cæsiata*, sleeping, but so lightly that your step disturbed it at once, and it was off over the heather, far away, yet the grey boulder gave it far greater protection than the yellow *populata* could ever have. Here, then, was a day of brilliant sunshine spent amongst the mountains; and though diligent search was made, the only *Lepidoptera* seen were six butterflies: *Lycæna Icarus*, one; *Vanessa urticæ*, one; *Chionobas Jutta*, one; *Erebia Blandina*, two; *Pararge Hiera*, one. *Geometræ*, four species: *Larentia didymata*, *cæsiata*, *Cidaria populata*, *Ortholitha limitata; Mimæseoptilus fuscodactylus; Simäethis Fabriciana; Ablabia pratana*. If results be measured by specimens, a very poor result of a long day's walk and work.

Bergen, Norway:
August 23*rd*, 1887.

P.S.—To-day and yesterday, September 6th and 7th, I took six specimens of *Platyptilus gonodactylus* amongst colt's-foot. This insect is well-known to be double-brooded, and that this is a second brood seems proved by my having in a former year taken the same plume at Christiania in June. The autumn specimens, as in England, are rather more dusky than those caught in summer.

Christiania: *September* 7*th*, 1887.

Parnassius Delius, Esp., captured in North Wales.—A specimen of *Parnassius Delius* was taken this summer near Bangor by Mr. E. W. S. Schwabe, a youthful pupil of this College, and was lately submitted to me for identification. It is the ordinary alpine form of this species, which is stated to be more restricted in range, and more exclusively alpine, than the commoner *P. Apollo*. Mr. Schwabe informs me that he took the specimen on September 1st in the mountains above the Penrhyn slate quarries, about seven miles from Bangor, near three small lakes; the sun was shining, but there had been rain earlier, and the insect was in a semi-torpid condition, and easily captured; it is rather worn. There can be no question of the authenticity of the capture; yet I think it must be regarded as highly improbable that the species is a native of these shores, or even an occasional immigrant. The most reasonable explanation seems to me to be that some admirer of the insect has imported pupæ, bred the butterflies, and turned them out in the Welsh mountains as the most suitable situation, in the hope that the species might establish itself. Perhaps some information may now be forthcoming.—E. Meyrick, The College, Marlborough: *September* 28*th*, 1887.

[We fear it is useless to attempt to naturalize *Parnassius* here unless the Butterflies be "preserved" by Act of Parliament with the direst penalties for infringement. They are probably the easiest to capture of all Butterflies.—Eds.]

White Butterflies.—I can testify to the abundance of White Butterflies at Inverness during the last four or five days of August, and the first fortnight of September in the present year, especially as compared with the same period last year, when the weather was much finer. They were mostly *P. rapæ*. I take this opportunity of mentioning the capture, on the 23rd inst., of *Phibalapteryx lapidata* in the upper part of Glen Nevis at a point distant about 16 miles from the head of Glen Rannoch.—A. H. CLARKE, 109, Warwick Road, S.W.: *September 28th*, 1887.

Additional Notes on the Butterflies of Dover.—Aporia cratægi—captured in the Warren about twelve years ago, W. Davis; one specimen much worn taken in Dover Town, 1882; in a lane near Sandwich this year seven specimens (*vide* separate note). *Pieris Daplidice*—near Diggles Tower, Dover, 1879. *Leucophasia sinapis*—Waldershare, 1880; near Alkham, 1882. *Colias Hyale* and *Edusa*—both pretty common the latter part of August and September, 1885, also the variety *Helice*. *Argynnis Selene*—in several inland woods near Shepherd's Well. *A. Adippe*—occasionally in company with *Aglaia*, common throughout the district this year. *A. Lathonia*—more recent captures than Mr. Hall's have been elsewhere recorded; the last genuine specimen was that taken by Mr. J. B. Williamson at Kingsdown in 1885. *Vanessa Antiopa*—at Alkham and Fredville, 1880. *Grapta c-album*—a single specimen at Lower Hougham, 1878; several at Upper Walmer, 1882. *Epinephele Tithonus*—Mr. Hall gives a vague locality, *near Canterbury*, which certainly is neither Dover nor its vicinity; as a fact, it has not been recorded as occurring in our district, the nearest spot where it may be met with is Adisham.

I have not thought it necessary to swell the list of localities given by Mr. Hall, or to add to his remarks on the more common species, such as *malvæ*, &c.; they may of course be found elsewhere if required and looked for. A Coleopterist would naturally not trouble himself to specially note down their occurrence.—SYDNEY WEBB, Maidstone House, Dover: *October*, 1887.

Aporia cratægi near Sandwich in 1887.—Seven specimens of *A. cratægi* were captured on the wing in a lane near Sandwich on July 13th, by a man named Burton, who was collecting for a friend, a policeman-entomologist.—ID.

Aporia cratægi at Sittingbourne in 1887.—There has been a good deal said of late about the extinction of *Aporia cratægi* in Great Britain, and as I have not collected insects for a good many years past, I took it for granted that the butterfly actually had become extinct. My first doubt on this head was caused by a statement to the contrary from Mr. Crowley, who if asked will, I am sure, be able to give you particulars. In my recent holidays I spent a week at Sittingbourne and visited an old friend, a lover of Nature from his boyhood, Dr. John Grayling, and he volunteered the information that in June his garden was visited by great numbers of the Black-veined White. I informed him that the butterfly was supposed to be extinct, which greatly surprised him. Dr. Grayling is an old and experienced field naturalist, and not likely to have been mistaken.—A. G. BUTLER, British Museum, Cromwell Road: *October* 10*th*, 1887.

New locality for Lycæna Artaxerxes.—On July 9th I took two specimens of *Lycæna Artaxerxes*, and at the same place a day or two afterwards five more: two of these were in fine condition, which I have preserved, the others being in a rather worn state were set at liberty. The place where I took the Butterfly was in the banky glades of a young fir cover, a little to the north-east of Cessford Castle, and about eight miles north of the English border of Northumberland. The common knapweed was plentiful in these glades, and upon it I saw the Butterfly settl occasionally, but I could see nothing of *Helianthemum vulgare* at that time. Mr Barrett has seen the two specimens I kept and thinks them pretty, but rather sma in size. He says he does not remember a locality so near the English border, an thinks it worth recording.—A. Elliot, Caverton, Roxburgh: *September 19th*, 188

Phytometra ænea and Emmelesia albulata in Roxburghshire.—I took severa specimens of *Phytometra ænea* on June 16th, and on the 29th, *Emmelesia albulata* both in the finest condition, this being the first time I have found them in Roxburghshire.—Id.

Sphinx convolvuli in Roxburghshire.—I have just had given me a specimen o *Sphinx convolvuli* taken in this locality by a boy, but sadly dilapidated in it capture.—Id.

Sphinx convolvuli at Armagh.—My neighbour, Mr. Thos. Smith, has jus brought over to me a specimen of this moth which was found by Mrs. Smith lyin dead outside her window this morning. This is the first time I have heard of it occurrence in this neighbourhood.—W. F. Johnson, Winder Terrace, Armagh *September 21st*, 1887.

Sphinx convolvuli at Swansea, and Deiopeia pulchella at Folkestone.—I an able to chronicle two additional captures of *Sphinx convolvuli*, both in the course o September last. One was taken in the town of Swansea, the other about two mile out of that town, by Raymond Burr. On looking through the collection of the latte I found one example of *D. pulchella*, taken by himself in August, 1886, at its ol habitat, Folkestone. The specimen is in very poor condition.—Lovell Keays 27, Lowndes Square, S.W.: *October 3rd*, 1887.

Concerning Deilephila euphorbiæ in Norfolk.—I think I can furnish a possibl explanation of Mr. Barrett's capture of *Deilephila euphorbiæ* in September. They are in some years very abundant in the neighbourhood of the Bilbao River in the north of Spain during the month of June, and are not rare in September, and as twenty or thirty steamers pass the coast of Norfolk every week carrying iron ore t the north of England from that river, it is not much of a stretch of imagination t suppose that one hidden away in the folds of a sail, and disturbed in transit, when near the coast, might land and be captured; or eggs might be laid by a specimen o a June importation, which, with the hot summer that we have experienced, might be advanced to the imago state by September.

It is a curious fact connected with *D. celerio*, and I believe also with *D. euphorbiæ*, and probably with other *Sphingidæ*, that their final transformation can be so much accelerated by heat.

In the autumn of 1885 I found a Virginia creeper on my house in Spain swarming with the caterpillars of *D. celerio* of all sizes, from half-an-inch to full grown. I collected and fed about six dozen of them, but the smallest did not assume the pupa state until well on in November. The earliest pupæ produced the imago without artificial heat in September, but I thought there was no chance of the later ones doing so until the following year; I therefore took the advice of a friend vho had tried the experiment successfully with *D. euphorbiæ*, and exposed them to temperature of 75° by day and about 60° at night, with the result that I had them ll as moths the same year, the last having emerged on Christmas Day. This exerience may not be new, but to me it was both new and interesting.—THOMAS ELL, Oakwood, Epping: *October 10th*, 1887.

Acidalia immorata, L.: a species new to Britain.—On June 27th last, Mr. C. I. Morris, of this town, showed me an insect of which he had just caught two pecimens, on some heathy ground in this neighbourhood. When alive in the hip-box, the insect somewhat resembled the female of *Fidonia atomaria,* to a form f which I hesitatingly referred it. Subsequent examination of the two specimens which proved to be ♂ and ♀) showed clearly it was not that species, and that it vas evidently new to the British list. I have recently, thanks to the assistance of lessrs. Waterhouse and Kirby, been enabled to compare the insect with types of *cidalia immorata*, L., collected by Prof. Zeller, in the National Collection at South ensington, with which it agrees in every respect.

Acidalia immorata, L. (Syst. Nat., x, 528), is widely distributed on the coninent. Staudinger's list gives the following distribution:—"Europe, central and orth—exclusive of the polar regions and England,—Andalusia, Italy, Bulgaria, outh-eastern Russia, Bithynia, north-eastern Siberia." It occurs in Holland, ccording to Snellen, "De Vlinders van Nederland," p. 563; and Berce, in his Faune Entomologique Française," says it occurs in "Basses Alpes, Auvergne, lsace, Bourgogne—but not in the environs of Paris."

Berce places it in the genus *Strenia*, with which its affinity is evident; but ccording to Staudinger's arrangement, it should stand in our lists close to *Acidalia marginata*.

Its food-plant is *Calluna vulgaris*, and it was among this plant that the two pecimens here mentioned were taken. It is probable that if places where *Calluna ulgaris* grows abundantly are well worked about the end of June or beginning of uly, the insect will be found in other localities.—J. H. A. JENNER, 4, East Street, ewes: *October 11th*, 1887.

Acidalia promutata and Melanthia ocellata.—With reference to Mr. Atmore's ote (Ent. Mo. Mag., 117) on the above species, what seems to be unusual in Norfolk, certainly the normal state of things in Kent. *A promutata:*—I find all the pecimens I have taken the last four years have been taken between July 30th and ugust 24th. The insect has occurred frequently at sugar on the Deal Sandhills, etween these dates *every* autumn since 1883. I used to get both broods regularly t Strood about twelve years ago, the autumn one usually greatly outnumbering the pring brood. *M. ocellata:*—This also is another normally double brooded species, ccurring abundantly in our Kent Woods in August. I believe it is double brooded n Scotland, certainly as far north as Yorkshire, and I have August specimens from outh Wales.—J. W. TUTT, Westcombe Park, S.E.: *October*, 1887.

The larva of Nascia cilialis.—It was so far back as the 14th August, 1868, hat the late Mr. Buckler received from Mr. W. R. Jeffrey (then residing at Saffron Walden) a larva of this species which Mr. Jeffrey had found feeding on *Cladium* *mariscus* at Wicken Fen. This larva, after being described and figured, unfortunate died; but another similar larva, which Mr. Jeffrey had retained and kept on son kind of *Carex*, became full-fed and spun itself up, but the pupa died before tl following spring, so the whole experiment proved a failure.

On the 23rd September, 1869, Mr. Buckler had again the pleasure of figurii this larva from a specimen sent him by the Hon. Thomas de Grey, M.P. (now Loi Walsingham); this larva duly fed up and spun its cocoon, but, the following summe an examination of this cocoon revealed that the larva had died without havii pupated! With this, Mr. Buckler's experience of this larva seems to have ende and as he had not succeeded in breeding the imago, he refrained, according to h usual custom, from publishing the very interesting description he had penned.

Now that at last the insect has been reared by Mr. W. H. B. Fletcher, I thougl it would interest many to know for how long a period this larva has been a half-solve mystery in this country.—H. T. Stainton, Mountsfield, Lewisham: *Septemb 26th*, 1887.

Description of the larva of Eupœcilia Degreyana.—Following the clue afford by the report that a specimen of this insect was once bred by the late Rev. Mr. Br from a larva found feeding in a flower of *Linaria vulgaris*, I have this year been ab to find it in considerable plenty. The larva is pale yellow, active, and rather lar compared with the size of the imago. Head brown; plate on the second segme pale yellow like the body, but with two black or brown spots on the hinder edg anal plate imperceptible; spots small, obscure. Burrowing into the ground pupate. I am unable to state at present how the first or summer brood feeds; b from the fact that all the early flowers are aborted, I suspect that the larvæ atta the young flower buds. Those collected in August and September feed within tl seed-pods on the unripe seeds. A single specimen emerged the second week September, which must have been gathered when in pupa in a *flower* head; this w probably a straggler of the early brood, unless, like *implicitana* sometimes, a thi brood occurs.—W. Warren, Merton Cottage, Cambridge: *September 21st*, 1887.

An Appeal for Larvæ for Description.—In consequence of the unfortuna death of the Rev. John Hellins, I have been asked to do what I can towards su plying life-histories to accompany the late Mr. Buckler's figures of the larvæ the British *Lepidoptera* now being published by the Ray Society, in those cases which no written or published descriptions were left by him. Thanks to tl liberality of many correspondents I have been able to describe several of the larv required for the third Vol. There are still some which I have failed to obtain, an so, as time is short, in order to avoid as much as possible leaving arrears to be dea with hereafter, I venture to appeal to the readers of this Magazine to give me much help as they can. I need not say that I shall be most happy to make an return in my power in kind or coin, as may be preferred.—W. H. B. Fletche Fairlawn House, Worthing: *September 22nd*, 1887.

On the life history of Euchromia purpurana, Hw.—The occurrence of th insect in localities so unlike each other as are Wicken Fen and the shingle beach the Sussex coast has helped one greatly in guessing at its probable food-plant. little looking about on the shore led me to notice that the moth always flew amon

Sonchus arvensis. On mentioning this to Mr. Warren, he was able to tell me that if the larva fed on this plant it would be found living underground in a silken tube and gnawing the roots externally. On June 29th and July 1st last I had the pleasure of proving this to be the case, by finding the larvæ feeding not only on the roots of the *Sonchus*, but also on those of *Taraxacum officinale*, between Shoreham and Brighton, as well as of taking both pupæ and imagines.

The larva is about 16 mm. long, thin rather than stout; head small, reddish-brown, mouth parts darker; body yellowish-white, corselet pale ochreous, pulsating vessel showing as a narrow darker dorsal line, warts small and very inconspicuous, each bearing a very short, fine, dark bristle; legs yellow; ventral area paler, claspers concolorous with it.

The larva crawls quickly, wriggling sharply backwards when disturbed. It pupates just below the surface of the shingle, spinning a few small pebbles firmly together, and making between them a tough, white, fusiform cocoon twice as long as the pupa. The latter is active, not remarkable in shape, light red in colour; the abdominal segments furnished dorsally with two rows each of short teeth, those of the first row being longer than those of the second.—Id.: *September 3rd*, 1887.

Note on the food plant of Depressaria badiella, Hb.—There is in vol. xxi of this Magazine, p. 3, an account of the larva of this species as occurring on Freshwater Down under leaves of *Hypochæris radicata* from the pen of the late Mr. Buckler. As every one may not have on his lawn enough of this troublesome weed on which to rear his series of the moth (I hope it is nearly exterminated on mine), it is perhaps worth recording that when working for larvæ of *Euchromia purpurana* I found those of the *Depressaria* feeding not only on *Hypochæris*, but also on *Sonchus arvensis* and *vulgaris*, on *Taraxacum*, and on other plants of the natural Order *Compositæ*.—Id.

Note on the food plants of Tortrix dumetana, Tr.; the record of a disappointment.—Early in June last I found on our Downs a *Tortrix* or *Depressaria* larva (to my eyes many of the larvæ of these genera are much alike), light and dark green in stripes, feeding on *Centaurea scabiosa.* Hurrah! thought I, here is the larva I have been looking for these many years, *Depressaria pallorella.* I went on picking away at the tubularly-rolled leaves, most of the *Depressaria*-like tubes being empty. Presently tubes and larvæ turned up on *Centaurea nigra, Knautia arvensis, Malva sylvestris*, and other plants. Hurrah again! unrecorded habit of a *Depressaria*—begins life by feeding on one plant, and goes in for a change of diet as it grows older; must make a note of this for the Ent. Mo. Mag. My wife collected the pupæ for me, so the blunder was not found out then. My disgust may be imagined when in August a series of *Tortrix dumetana* came out, and found me without a description of what I had thought to have been a larva well known to every collector of *Micro-Lepidoptera* but myself.—Id.: *September 5th*, 1887.

Cosmopteryx Schmidiella in the Isle of Purbeck.—I have much pleasure in recording the occurrence of this interesting species in the Isle of Purbeck, where lately, by a most lucky chance, I happened to meet with the larva. At the beginning of the present month I received from Mr. W. H. B. Fletcher, who added the insect to the British list in the autumn of last year (*vide* Ent. Mo. Mag., xxiii, p. 111), a batch of the larvæ feeding in the leaves of *Vicia sepium*; so, wishing to supply them with fresh food, I wandered in search of the vetch, and on *the very first plant* I came across, to my surprise and delight, I beheld the whitened leaves unmistakeably eaten out by the larvæ of *C. Schmidiella*. Subsequent search during the limited time at my disposal showed the species to be well established in its locality. I may mention that this recent addition to the British fauna is the only representative of the genus *Cosmopteryx* found, as yet, in the County of Dorset.—Eustace R. Bankes, The Rectory, Corfe Castle: *September*, 1887.

Another Caddis-fly new to the British Isles: Tinodes maculicornis, Pict.—This further addition to our list of *Trichoptera* is also from Ireland, this time from the north. Two specimens are in a small collection made at Glasslough, Co. Monaghan, on the 9th and 10th of August. They were taken along with *T. wæneri*, which swarmed, by beating the bushes surrounding the lake, and the species was probably not uncommon but overlooked amongst the hosts of its undesirable congener.

Though now recorded for the first time, *T. maculicornis* is not new to Ireland. I find that in the collections made by Miss Freeland in the same locality (*vide* vol xx, p. 142, and vol. xxiii, p. 138), I passed by one or two unset examples of it as *T. wæneri*.

The ascertained distribution of this species is chiefly western, Portugal and France; it also occurs in Switzerland. Most of the members of the genus *Tinodes* delight in dribbling springs; *T. maculicornis* seems to prefer large rivers and lakes. —Kenneth J. Morton, Carluke, N. B.: *October* 10*th*, 1887.

Additional Trichoptera from Glasslough, Ireland.—As a continuation of the series of records from this locality (see citations in preceding note), it may be well to notice the occurrence of *Glyphotælius pellucidus*, Retz., and *Leptocerus fulvus*, Ramb., both taken in August.—Id.

Cæcilius Dalii abundant in Somersetshire.—In the second week of this month the Rev. A. E. Eaton and I found this pretty and delicate Psocid abundantly in gardens and plantations at Shepton-Montague, chiefly amongst common laurel (*Prunus lauro-cerasus*) and evergreen oak (*Quercus ilex*); fagots of *dead* laurel branches were equally productive. It would seem that the species is especially attached to gardens, and it may have been originally introduced from a warmer climate. But its perfect hardiness is established, severe frosts and cold rain and winds prevailing at the time we met with it. I fancy this insect is widely distributed in England. Mr. J. J. King found it at Weybridge on a paling outside a garden.—R. McLachlan, Lewisham, London: *October* 17*th*, 1887.

Coleoptera in the Isle of Wight.—Whilst staying at Sandown from June 27th to July 25th last, during the greater part of the very hot weather then prevailing, I paid considerable attention to the *Coleoptera* of the district; the capture of an exceedingly rare British weevil (*Baris analis*) during a short walk on the evening of my arrival, being a great incentive to further exertions. Though I have little if anything to add to the list of *Coleoptera* known to inhabit the localities mentioned below, the recent occurrence of a few of the rarer species may be of interest. I accordingly, at my friend Mr. Fowler's suggestion, give a list of some of the most noteworthy forms observed during my stay.

Certain well-known species were, however, not to be found, viz., *Chlænius Schranki* (the locality at Luccombe has of late years been partly washed away and partly drained, and the insect would appear to have become quite extinct there), *Otiorhynchus ligustici*, &c. *Cicindela germanica*—plentiful at its old locality near Blackgang Chine; I have seen no recent record of this species in the island. *Stenolophus teutonus* and *Acupalpus flavicollis*—common at Sandown, at the roots of *Juncus* at the foot of the cliffs. *Bembidium Sturmi*—one example in wet shingle, Luccombe. *Tachys bistriatus*—rarely in moist sandy places, Luccombe. *Aëpus marinus*—at its usual habitat, Sandown and Ventnor (*A. Robini* was not to be found). *Hydræna nigrita*—rather commonly, Luccombe Chine. *Georyssus pygmæus*, *Limnichus pygmæus*, *Heterocerus fusculus*—abundant at Luccombe and Sandown in wet sandy places. *Ochthebius rufimarginatus*—rarely at Luccombe. *Phytosus*—both species on the beach, Sandown and Luccombe. *Atemeles emarginatus*—one example, running across the path, Bonchurch. *Lathrobium angustatum*—a few examples at Sandown, in company with *Stenolophus*. *Ocypus pedator*—rarely on the chalk downs, Freshwater. *Bledius opacus* (abundant), *B. spectabilis*, *B. tricornis*, *B. atricapillus*, *B. subterraneus*, and *B. arenarius*, more or less commonly, Sandown. *Oxytelus clypeo-nitens*—rather commonly in the stream at Luccombe Chine, beneath stones, in company with *Dianous*, no doubt accidentally brought down by the stream after heavy rain. *Thinobius brevipennis*—somewhat commonly at Sandown, in moist sandy places; this exceedingly minute creature is difficult to detect, and is only to be found when the sun is shining. *Ancyrophorus longipennis*—rarely, Luccombe Chine, with *Dianous*; I have not seen any record of this species occurring so far south before. *Micralymma brevipenne*—in abundance, beneath boulders, below high water mark, Sandown. *Philonthus signaticornis*—not rare, moist places, Sandown. *Cyrtusa pauxilla*—rarely, Sandown. *Saprinus maritimus*—beach, Sandown, rare. *Syncalypta hirsuta*—roots of grass, &c., Freshwater, not rare. *Aphodius villosus*—Chalk Downs, Freshwater, rare. *Phaleria cadaverina*—in profusion on the beach, Sandown. *Cteniopus sulphureus*—on the Chalk Downs, Freshwater. *Mordellistena inæqualis*—rarely, by sweeping, Sandown. *Sitones cambricus*—plentiful in moist sandy places, especially by beating towards evening, Sandown; *S. meliloti*—rarely, Luccombe. *Cathormiocerus socius*—seventeen examples, by constant working at the roots of isolated plants (*Sonchus*, &c.), in clean sand at the foot of the cliffs, near Sandown; this insect very closely resembles the numerous species of *Trachyphlœus* (*scaber*, *scabriculus*, *squamulatus*, and *alternans*) which are more or less abundant at the same locality. *C. socius* differs constantly from *C. maritimus* exactly as pointed out by Rye (*cf.* Ent. Mo. Mag., vii, p. 150, and x, p. 177); the latter is a perfectly distinct species. *Baris analis*—one specimen, crawling on the sand in a moist place at the foot of the cliffs at Sandown, on the evening of June 27th; subsequent search at the same spot and elsewhere, and at the roots of its recorded food-plant (*Inula dysenterica*), failed to produce more. So far as I am aware, this species has not been captured in England for fully 25 years, and the only recorded localities for the two or three known British examples are Ryde and Sandown. The food-plant is very abundant in the Island, though not always accessible on the steep face of the cliffs, and there is no reason why the species should remain so rare with us. *Bagous lutulentus*—not rare in moist places, Luccombe; some examples have the tarsi dark, and seem intermediate between *B. lutulentus* and *B. nigritarsis*, Thoms. *Orchestes* *scutellaris*—rather common on alders, Sandown. *Ceuthorhynchus resedæ*—at the roots of its usual food-plant (*Reseda luteola*), and *Miarus graminis* (common), Chalk Downs, Freshwater. *Sibynes arenariæ*—Blackgang Chine, beneath its usual food-plant. *Cryptocephalus moræi, C. bilineatus*, &c.—on the Chalk Downs, Bembridge.—GEO. C. CHAMPION, Caldervale Road, Clapham, S.W.: *October 13th*, 1887.

Recent captures of Coleoptera at Windsor and Chobham.—Whilst staying at Egham, in Surrey, during the latter half of last month I took the opportunity of hunting up the *Coleoptera* of the neighbourhood, confining myself chiefly to Windsor and Chobham. Omitting the common species captured, the following is the result of my investigations:—

In Windsor Great Park. In nests of *Formica rufa* occurred *Thiasophila angulata, Dinarda Märkelii, Leptacinus formicetorum, Ptilium myrmecophilum, Dendrophilus pygmæus, Monotoma angusticollis.* Under bark: *Agathidium varians, Homalota linearis, H. immersa, Placusa pumilio, Cicones variegata* (60), *Ditoma crenata* (153), *Plegaderus dissectus* (18), *Rhizophagus perforatus* (1), *Pediacus dermestoides* (1), *Silvanus unidentatus* (25), *Læmophlœus ferrugineus* (5), *L. duplicatus* (1), *Mycetophagus atomarius* (extremely abundant in one beech stump on Snow Hill), *Aspidiphorus orbiculatus* (1). In fungi: *Homalota nigritula, H. divisa, H. celata, H. canescens, Cis hispidus, C. nitidus, C. pygmæus.*

Chobham Common produced the following. In *Sphagnum* on the margins of ponds: *Bembidium Doris* (45), *Amara patricia* (1, an unsuspected habitat for this species), *Acupalpus dorsalis* (3), *Tachyusa atra* (2), *Myllæna intermedia* (20), *M. Kraatzi* (5), *Gymnusa brevicollis* (100), *Deinopsis erosa* (5), *Philonthus nigrita, P. cinerascens, Stenus pusillus, S. binotatus, S. pallitarsis, S. fornicatus* (2), *Anisosticta* 19-*punctata* (1 only!), *Cassida nobilis* (1), *Thyamis holsatica* (1), *Anthicus antherinus* (1), *Baris T-album* (1). In the ponds: *Pelobius Hermanni* (9), *Hydroporus flavipes* (3), *H. lepidus* (extremely abundant), *H. obscurus* (1), *H. lineatus* (1), *Colymbetes fuscus* (2), *Agabus affinis* (1), *Dytiscus circumflexus* (2), *D. punctulatus* (2), *Helochares punctatus* (1), *Philhydrus marginellus* (3), *Hydrochus angustatus* (5). In dung: *Homalota inquinula* (2), and *Trichopteryx bovina.* By brushing aquatic plants I took *Donacia comari* (3).—W. G. BLATCH, 214, Green Lane, Smallheath, Birmingham: *October 9th*, 1887.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY: *September 22nd*, 1887.—R. ADKIN, Esq., F.E.S., President, in the Chair.

Mr. Jäger exhibited *Stilbia anomala*, Haw., from Tenby, *Callimorpha Hera*, L., and var. *lutescens*, Staud., from Devon, and stated he had obtained ova, and now had the larvæ feeding. Mr. Sheldon, *Xanthia fulvago*, L., and var. *flavescens*, Esp., and remarked on the number of melanic specimens which he had observed in a particular valley in Derbyshire. Mr. Cooper, dark forms of *Eugonia quercinaria*, Hufn., upon which some interesting comments were made by Mr. Goldthwaite. Mr. Carpenter, a number of specimens of *Argynnis Paphia*, L., var. *Valezina*, Esp. Mr. Tutt, *Melanthia bicolorata*, Hufn., var. *plumbata*, Curt., from Rannoch. Mr. Oldham, *Dicycla oo*, L., from Epping Forest, a dark form of *Arctia Caia*, L., and a variety of *Pararge Megæra*, L.: it appeared from the remarks of members that *D. oo* had occurred freely at Epping and in some parts of Kent. Mr. Skinner exhibited a specimen of *Deiopeia pulchella*, L., taken at Dover, 1886, a bleached specimen of

Epinephele Janira, L., and very pale forms of *Zygæna filipendulæ*, L. Mr. Adkin, bred *Melanippe rivata*, Hb., *M. galiata*, Hb., and *Anticlea cucullata*, Hufn. Mr. Goldthwaite, varieties of the under-side of *Lycæna bellargus*, Rott. Mr. Elisha, *Gelechia hippophaella*, Schr., from Deal, *G. vilella*, Zell., *Incurvaria capitella*, Clerck, *Agrotis Ashworthii*, Dbl., &c. Mr. J. Jenner Weir, *Carpocapsa saltitans*, Westw., and living specimens of the larva of *Myrmeleon europæus*, and made some interesting remarks. Mr. West, of Greenwich, showed eight species of *Haliplus* taken by him out of one pond. Mr. Billups, on behalf of Mr. Tugwell, exhibited *Limneria ensator*, Gr., and *Macrocentrus linearis*, var. *pallidipes*, Gr., both bred from *Cucullia gnaphalii*, Hb., and, on behalf of Mr. Turner, two old wedges, which had been used to fasten the chairs holding the rails to the sleepers on L. B. & S. C. Railway, between New Cross and Forest Hill, containing nests of *Osmia rufa*, L.

October 13*th*, 1887.—The President in the Chair.

Dr. Rendall exhibited *Xanthia fulvago*, L., var. *flavescens*, Esp., &c. Mr. Jäger, varieties of *Luperina testacea*, Hb., from Tenby. Mr. Tugwell, a specimen of *Sphinx convolvuli*, L., taken at Greenwich, a fine streaked variety of *Spilosoma menthastri*, Esp., and other forms of this species. Mr. Wellman, bred examples of *Acidalia immutata*, L. Mr. Levett, two varieties of *Smerinthus tiliæ*, L. Mr. Oldham, *Lepidoptera* from India. Mr. Fremlin, specimens of *Vanessa urticæ*, L., showing absence of colour. Mr. Jenner, of Lewes, exhibited two specimens of *Acidalia immorata*, L., a species new to Britain, which he stated were taken at Lewes, on heather, by Mr. H. C. Morris, of that town. Mr. South, *Melanippe sociata*, Bork., *M. montanata*, Bork., an apparently apterous specimen of *Zygæna filipendulæ*, L., bred by him at Folkestone, 1885, a specimen of *Z. loniceræ*, Esp., appearing to have four antennæ; after some discussion, Mr. Tugwell expressed an opinion that the second pair were merely the pupal coverings of the antennæ proper, as the insect did not seem to have altogether escaped from the pupa case, part of it still adhering to the head. Mr. South also showed four varieties of *Argynnis Selene*, Schiff., and one of *A. Euphrosyne*, L. Mr. West (Greenwich), *Hydaticus seminiger*, De G., and stated it was twelve years since he last met with this species. Mr. Manger, *Hymenoptera* from Brazil.—H. W. Barker, *Hon. Secretary.*

Entomological Society of London: *Oct.* 5*th*, 1887.—Dr. David Sharp, F.Z.S., President, in the Chair.

Mr. Jacoby exhibited a specimen of *Aphthonoides Beccarii*, Jac., a species of Haltica having a long spine on the posterior femora. He also exhibited a specimen of *Rhagiosoma madagascariensis*, and remarked that it had the appearance of a Longicorn.

Mr. Stevens exhibited a very dark specimen of *Crambus perlellus* from the Hebrides, which its captor supposed to be a new species. Mr. Porritt remarked that this brown form of *Crambus perlellus* occurred at Hartlepool with the ordinary typical form of the species, and was there regarded as only a variety of it.

Mr. Slater exhibited a specimen of *Gonepteryx Cleopatra*, which was stated to have been taken in the North of Scotland. Mr. Jenner Weir remarked that although the genus *Rhamnus*—to which the food-plant of the species belonged—was not a native of Scotland, some species had been introduced, and were cultivated in gardens.

Mr. South exhibited an interesting series of about 150 specimens of *Boarmia repandata*, bred in 1876, and during the present year, from larvæ collected on bilberry in the neighbourhood of Lynmouth, North Devon, including strongly marked examples of the typical form, extreme forms of the var. *conversaria*, Hüb., a form intermediate between the type and the variety last named, and examples of the var. *destrigaria*, Steph. Mr. South said that an examination of the entire series would show that the extreme forms were connected with the type by intermediate forms and their aberrations.

Mr. Poulton exhibited young larvæ of *Apatura Iris*, from the New Forest; also eight young larvæ of *Sphinx convolvuli* reared from ova laid on the 29th August last by a specimen captured by Mr. Pode in South Devon. Mr. Poulton said the life-history of the species was of extreme interest, throwing much light upon that of *Sphinx ligustri*, as well as upon difficult points in the ontogeny of the species of the allied genera *Acherontia* and *Smerinthus*. Mr. Stainton commented on the interesting nature of the exhibition, and said he was not aware that the larvæ of *Sphinx convolvuli* had ever before been seen in this country in their early stages. Mr. McLachlan remarked that females of this species captured on former occasions, when the insect had been unusually abundant, had been found upon dissection to have the ovaries aborted.

Mr. R. W. Lloyd exhibited two specimens of *Elater pomonæ*, and one of *Mesosa nubila*, recently taken in the New Forest.

Mr. Porritt exhibited a series of melanic varieties of *Diurnea fagella*, from Huddersfield, and stated that the typical pale form of the species had almost disappeared from that neighbourhood.

Mr. Goss exhibited, for Mr. J. Brown, of Cambridge, a number of puparia of *Cecidomyia destructor* (Hessian fly), received by the latter from various places in Cambridgeshire, Norfolk, Suffolk, and Wiltshire. Mr. Verrall, in reply to a question by Mr. Enock, said he believed that the Hessian fly was not a recent introduction into Great Britain, but had been here probably for a great number of years. Prof. Riley said he was unable to agree with Mr. Verrall, and was of opinion that the Hessian fly had been recently introduced into this country. Its presence here had not been recorded by Sir Joseph Banks, by Curtis (who paid great attention to farm insects), by Prof. Westwood, by the late Mr. Kirby, or by any other entomologist in this country who had given especial attention to economic Entomology. It seemed highly improbable, if this insect has been here so many years, that its presence should have so long remained undetected both by entomologists and agriculturists. It had been stated that the insect was introduced into America by the Hessian troops in 1777, but this was impossible, as its existence at that date was unknown in Hesse. Mr. McLachlan, Mr. Elwes, Mr. Verrall, Mr. Jacoby, and Dr. Sharp continued the discussion.

Mr. James Edwards communicated the second and concluding part of his "Synopsis of British *Homoptera-Cicadina*."

Prof. Westwood contributed "Notes on the life-history of various species of the Neuropterous genus *Ascalaphus*."

Mr. Elwes read a paper "On the Butterflies of the Pyrenees," and exhibited a large number of species which he had recently collected there. Mr. McLachlan said he spent some weeks in the Pyrenees in 1886, and was able to confirm Mr. Elwes' statements as to the abundance of butterflies. He remarked on the occurrence of Spanish forms in the district, and on the absence, as a rule, of the peat-bogs so common in the Swiss Alps. The discussion was continued by Mr. Distant, Mr. White, Dr. Sharp, and others.—H. Goss, *Hon. Secretary*.

NOTES ON THE SPECIES OF HEINEMANN'S FAMILY *CHAULIODIDÆ* THAT OCCUR IN ENGLAND.

BY WILLIAM WARREN, F.E.S.

In response to a request by Mr. Stainton, I have undertaken to put together a few notes on these species, embodying the latest discoveries, as yet unpublished, of their habits and mode of life. This information is, for the most part, derived from the observations of others, notably of Mr. W. H. B. Fletcher, of Worthing, whose well-known pertinacity in investigating the earlier stages of our *Micro-Lepidoptera* has been so often rewarded with success.

Heinemann assigns to his family *Chauliodidæ* five genera, viz., *Heydenia*, Hofm., *Æchmia*, St., *Chauliodus*, Tr., *Ochromolopis*, H., and *Schreckensteinia*, H. Of these the last may, I think, be dismissed as being entirely out of place in the family, while the 4th (*Ochromolopis*) containing but one species (*ictella*), not yet occurring in England, needs only to be noticed as forming a connecting link between *Chauliodus* and *Æchmia*.

The characteristics of the family, as distinguished from other families, may be shortly given thus :—

Head smooth ; ocelli absent ; antennæ without eye-caps ; palpi filiform, closely scaled. Fore-wing with additional cell, the lower median nervure forked at the base. The four genera can be also practically separated *inter se* as follows :—

A. Palpi longer than the head, ascending.
  a. Inner margin of fore-wing with at least two teeth of scales ..1. *Chauliodus.*
  b. Inner margin of fore-wing with only one tooth .... 2. *Ochromolopis.*
B. Palpi short, drooping.
  a. Inner margin of fore-wing with only one tooth .. .. 3. *Æchmia.*
  b. Inner margin of fore-wing without tooth ....4. *Heydenia.*

The larvæ of subd. A. feed mostly on the *leaves* and *flowers*, only a few species are seed feeders ; those of subd. B. exclusively on the *seeds* of their food-plants.

All the species of *Chauliodus* whose life-history is known are double-brooded. In most, if not in all, cases the ♀ imagos of the autumn brood hibernate, and lay their eggs in early spring. The larvæ are sluggish, short and stout in shape, with a glistening skin and distinct spots. When first hatched, they mine the leaves and stalks of their food-plants ; later on they feed externally on the cuticle of the leaves, which they spin together by a few threads, covered, as Mr. Stainton remarks (Nat. Hist. Tin., xii, 70), with a glutinous secretion, which collects in minute globules. In habit they appear more or less gregarious. The pupa is enclosed in an open network cocoon. The perfect insects are not often seen; they fly at dusk in the neighbourhood of their food-plants.

Four species are at present known to occur in England, which I propose to tabulate thus:—

A. Fore-wing with *falcate* apex.
  a. Inner margin with *four* teeth of scales ....1. *chærophyllellus.*
  b. Inner margin with *two* teeth of scales ... .2. *Illigerellus.*
B. Fore-wing with *rounded* apex.
  a. Inner margin with *four* teeth of scales ....3. *daucellus.*
  b. Inner margin with *two* teeth of scales ....4. *insecurellus.*

1. *chærophyllellus*, Goetze, iii, 4, 169, 292; St., I. B., 234, Man., 2, 397; Frey, Tin., 267, Lep., 401; Hein., 411; Snell., 947; = *testaceella*, Hub., 326; Z., Isis, 1839, 211; H.-S., v, 47 and 213; Dup., iv, 75, 9; = *fasciculellus*, Stph., Ill., iv, 218, 39, 1; Wd., 1234.

Fore-wing variable in colour and distinctness of markings, ashy-grey, more or less tinged with ochreous. From the inner margin near the base a purplish-grey indeterminate fascia runs obliquely, first to the middle of the wing, and thence broader and darker to the costa; on its outer edge stands a short black dash, at each end of which is a white dot; beyond it before the apex a longer black dash, pointed towards the base, and preceded by an angulated pale fascia. Along the costa are sundry small black dots, and before the apex along the hind margin two or three white ones. The teeth of scales are brown or black: the first and largest stands at the rise of the dark fascia; the second, smaller, in the middle of the inner margin; the third and fourth, quite small, being close to one another. Fringes with two (not three, as Heinemann says) blackish dividing lines, diverging, and vanishing before the anal angle. Below the apex the outer of these dark lines is strongly bent inwards towards the inner one, so that the fringes immediately below the apex become pale and unmargined, and, in consequence, the wings appear to be more falcate than is really the case.

Sometimes the whole fore-wing is dark grey or reddish-brown, with the fascia very obscure.

The summer brood is on the wing in July and August, the second emerges in October.

Larva gregarious, yellowish- or greenish-white, with a whiter dorsal vessel and brownish spots, glassy looking; head pale brown. On various *Umbelliferæ*, especially *Heracleum sphondylium* and *Pastinaca sativa*; feeding on the under-surface of the large lower leaves beneath a slight web, and pupating among rubbish on the ground. The first brood, which, according to Mr. Stainton, is much less numerous than the 2nd, is full fed in June, the second in September.

2. *Illigerellus*, Hüb., 333; Tr., ix, 2, 32; Dup., xi, 294, 1, p. 204; St., I. B., 234, Man., 2, 397, N. H. T., xii, 96; Ev., F. V. U., 576; Frey, Tin., 268, Lep., 401; H.-S., v, 207; Hein., 409; Snell., 847; = *falciformis*, Haw., 555; Stph., Ill., iv, 221; Wd., 1241.

Fore-wing dull pinkish-ochreous, clouded with tawny; a tawny streak from the centre of the base and along the costa. From the inner margin near the base a dark tawny shade runs obliquely to the centre of the fore-wing, and thence curved and broader to the costa; on its outer edge is a black dot, from which indistinct tawny streaks radiate towards the apex and anal angle, and often a smaller dot stands on the inner edge. Fringes with two dark brown dividing lines, divergent, and vanishing before the anal angle. Teeth of scales brown; the larger at the beginning of the fascia, the smaller just before the centre of the inner margin. The falcate appearance of the fore-wing is still more conspicuous in this species than in *chærophyllellus*, inasmuch as the dark outer dividing line of the fringes describes a much ampler curve below the apex, and so a much larger space of the fringes themselves is left pale and unmargined. VI *e*, VII *b*, and VIII, IX.

Larva yellowish-green, dorsal vessel darker, head yellowish. On *Angelica sylvestris* and *Ægopodium podagraria.* It is the spring brood, feeding in May and June, which lives, as the Manual has it, in crumpled leaves, after the fashion of *Depressaria angelicella.* The summer brood was found by the Rev. C. R. Digby in August, eating round holes through the sheaths of the unexpanded umbels of *Angelica*, and feeding on the immature flowers within. The insect is probably of more general distribution than is commonly supposed. It is abundant in the fens of Cambridgeshire and Norfolk where the *Angelica* flourishes.

3. ***daucellus***, Peyerimhoff, Pet. Nouv., 1870, 15, 57; Stn., E. A., 1873, p. 49, N. H. T., xii, 82.

Fore-wing long, narrow, with straight costa; bone colour, more or less tinged with ochreous, but always with the entire inner margin and a narrow streak along the centre of the wing reaching to the apex, left of the pale ground colour. A brownish cloud at the base and along the costa; a very narrow oblique greyish-brown fascia runs from the inner margin at one-third from the base to the costa, where it broadens out into a more distinct blotch; in the central pale streak before the apex is a largish dark brown spot; on the costa just before the apex are two or three dark spots, and in some cases one or two near the base. Head whitish-ochreous; palpi dark grey, teeth of scales blackish; the first, the largest, at the base of the fascia; the rest smaller, at equal distances beyond; the dividing lines of the fringes *not* interrupted below the apex, but diverging from each other, and vanishing long before the anal angle.

With us the first brood flies in Midsummer, and the second in September and October. Larvæ yellowish-green, with slightly darker dorsal vessel; head black; hinder edge of 2nd segment with a black plate divided in the centre; spots large and black. On *Daucus carota*, mining the tips of the leaves, so that they become pale brown. The larvæ were first found in England by Mr. Digby in August and September, 1883, and in the following spring by Mr. Fletcher in the Isle of Wight.

Occurs along the South Coast in Dorset and the Isle of Wight, also in Arundel Park, Sussex. The first specimens captured in England were taken in October, 1866, at Ventnor, by Mr. C. W. Dale (*vide* Ent. Ann., 1873, p. 49).

4. *insecurellus*, Stn., I. B., 234, Man., 2, 397; Hein., 410; = *Illigerellus*, Stn., Zool., 1848, p. 2035; = *dentosellus*, H.-S., 967, v, p. 208.

Fore-wing short and stumpy, the costa decidedly shouldered at one-third from the base; pale whitish-grey, dusted with darker, especially at the base of the costa. A greyish-yellow fascia rises on the inner margin before the middle, and runs widening nearly perpendicular to the costa; from the anal angle another yellowish-grey fascia runs obliquely inwards, and sometimes unites with the first near the costa; beyond it towards the apex are two other indistinctly margined yellowish-grey blotches; two small black dots, one beyond and in a line with the other, lie in the centre of the wing. The apical two-thirds often much obscured by a dark grey cloud; head pale grey; teeth of scales black, the first the larger, at the base of the first fascia, the second halfway between it and the anal angle; the dividing lines of the fringes unbroken below the apex, *not* divergent, and continued quite to the anal angle. V *e*, VI *b*, and VII *e*, VIII.

Larva sluggish, glossy, yellowish, with distinct brown spots; head black; plate on 2nd segment dingy, posteriorly with a sharply-defined black point next the dorsal line; dorsal line narrow, brown; sub-dorsal light brown, irregular, especially on the upper edge; anal flap with blackish plate; legs black externally. On *Thesium humifusum*, at first mining out the small leaves and feeding down inside the stalk, afterwards attacking the leaves externally; the larvæ of the summer brood also feeding on the flowers and green seeds. Pupa among the matted roots of the food-plant, or in moss growing round it. The spring brood feeds up in April and May, the second in July.

Until 1884, the only known British specimens were those taken in 1847 by Mr. Stainton and others at Stoat's Nest, beyond Croydon. In 1884, however, Mr. Fletcher captured a specimen on the chalk downs of the Isle of Wight, and I found another near Riddlesdown in Surrey. Mr. Stainton's notice (Ent. Mo. Mag., xxi, p. 255) indicating *Thesium humifusum* as the probable English food-plant, led the next year to the discovery of the larvæ in both localities, and they have since been taken in plenty on the Dorset Downs by the Rev. C. R. Digby and Mr. Bankes, and Mr. Fletcher has observed them in Sussex, in Arundel Park, and near Eastbourne.

Mr. Stainton in the Manual mentions three tufts of scales on the inner margin, a peculiarity which characterizes a continental species, *iniquellus*, Wo., only.

The second genus, *Ochromolopis*, of which the only known species (*ictella*, H.) occurs in South Germany and Switzerland, is also probably like *Chauliodus*, double brooded. Heinemann states that it appears in June on into August, and that the larva feeds on *Thesium montanum* in May. The imago of *ictella* is dull leaden-colour, with longitudinal orange streaks ; the fringes *without* dividing lines.

Genus 3, *Æchmia*, St.—This genus, with that following (*Heydenia*) are distinguished from the two preceding by the *short*, *drooping* palpi ; the insects comprised therein are *single* brooded, the larvæ feeding in autumn on the seeds of *Umbelliferæ*.

dentella, **Zell., Isis, 1839, 204 ; F. R., 83, 3, p. 245 ; H.-S., v, 259 ; Frey, Tin., 177, Lep., 381 ; Stn., I. B., 177, Man., 2, 365 ; Hein., 408 ; = *subdentella*, Stn., Cat., 20 ; = *atrella*, Stph., Ill., iv, 354 ; Wd., 1578.**

Fore-wing short, broad, stumpy ; deep brown-black, with a purplish tinge ; tooth of scales at one-third from the base ; the inner margin slightly paler before and beyond it. Fringes concolorous, dusted with darker scales near their base, and with a single dividing line before their apex. Hind-wing dark fuscous. VI.

Larva glossy, yellowish, with distinct spots, and alternate pale and dark longitudinal lines : head dark brown. On seeds of *Chærophyllum temulentum*. Living at first inside the separate seed-heads, afterwards spinning the seed-heads together with a slight web, in which the larva rests, eating out their contents. Very much like that of *Chauliodus insecurellus*. Full fed at the end of July and beginning of August. Pupa on the ground in a slight web.

The larvæ were first found in this country two years ago by Messrs. Fletcher and Digby near Arundel ; last year I found them commonly all round Cambridge, always on the above-named plant ; but it seems pretty certain, from notices kindly forwarded by Mr. Stainton, that on the continent they feed on the seeds of other *Umbelliferæ*. Thus E. Hofmann mentions *Pimpinella saxifraga*, as well as *Chærophyllum*, while both Sorhagen and Schmid have, it would appear, found them on *Ægopodium podagraria*. Heinemann says, "Larva on seeds ; larva in August on *Angelica sylvestris*." Fischer von Röslerstamm says that the imagos were taken by Herr Zeller at Glogau, *in cop.*, on flowers of *Chærophyllum bulbosum*, towards sunset in June.

The imago is very sluggish, but may be beaten from hedge rows into an umbrella, or taken at rest on the flowers of *Umbelliferæ* ; but the caught insect gives but a faint idea of the blackness of bred examples.

Genus 4, *Heydenia*, Hofm.—Agreeing with *Æchmia* in all other particulars, but the imagos in this genus are devoid of any projecting scales along the inner margin, and of dividing lines in the fringes. Our three British species may be distinguished by the number of the spots.

A. Fore-wing with three yellow spots .... 1. *auromaculata*, Frey.
B. Fore-wing with two yellow spots .... 2. *fulviguttella*, Z.
C. Fore-wing unspotted .... 3. *profugella*, Stn.

1. *auromaculata*, Frey, Schweiz., E. G., ii, 7, 290, Lep., 376; Hein., 405; Ba., Ent. Mo. Mag., xxiii, 13.

Fore-wing dusky olive-brown, with three dull orange spots; the 1st on the inner margin before the middle, the 2nd between it and the apex, the 3rd below the costa towards the base; this last often indistinct, and composed of two smaller spots. The base is often dusted with orange, and sometimes an indistinct orange streak appears along the fold. Hind-wing greyish-brown. Head dull orange. VIII, IX.

Larva dirty white; head small, black; corselet smutty in front, edged with black behind; sub-dorsal lines brown, pale, indistinct; spiracles black; spots large, grey, with short dark bristles; anal flap smutty; a dull smutty bar on the 13th segment; legs black. Feeding in autumn inside the carpels of *Angelica sylvestris*, uniting them together and passing from one to another. Pupa, in captivity, among the seed-heads.

This species was first detected in Shetland in 1883 by Mr. Mc Arthur. The larvæ were collected in plenty in the autumn of 1886 by Messrs. Curzon and Salvage. It occurs also in the Swiss Highlands, and appears to be exclusively a sub-alpine form.

2. *fulviguttella*, Z., Isis, 1839, 193; H.-S., v, 140; Frey, Tin., 159, Lep., 376; Hein., 405; Snell., 738; = *minutella* (*Œc.*), Stph., Ill., iv, 354; Wd., 1577; = *flavimaculella* (*Œcophora*), Stn., I. B., 157, Man., 2, 351.

Fore-wing dusky olive-brown, with only two dull orange spots, one on the inner margin, and the other between it and the apex; the base sometimes also dusted with orange. VII, VIII.

Larva whitish, with brownish head. In seeds of *Angelica sylvestris* and *Heracleum sphondylium* in late autumn.

Statariella, Heyd., a continental species, seems to be an intermediate form, having sometimes only *two* orange spots, as in *fulviguttella*, and at others traces of the additional costal spot of *auromaculata*.

3. *profugella*, Stn., E. A., 1856, 38, 1864, 107, Man., 2, 402; Hein., 406; Frey, Lep., 376; Hodgk., Ent. Mo. Mag., x, 90.

Fore-wing pale bronzy-grey, with an ochreous tinge; head, thorax and fringes concolorous. VII, VIII.

Larva light grey, slightly hairy, and with small brown spots, feeding on the seeds of *Pimpinella saxifraga*, fastening the seed capsules together with silk. This species has occurred in Kent, but appears far more abundant in Lancashire, where it has been bred by Messrs. Threlfall and Murray, *always* from the above-mentioned plant. Other food-plants recorded are *Angelica*, *Heracleum* and *Ægopodium* (Hofm.), and *Gentiana* (Hodgk.).

The species was placed by Mr. Stainton in the Manual in his mixed genus *Asychna*, comprising *modestella* (a species allied to the *Coleophoræ*), *æratella* (which feeds in galls on *Polygonum*), and *terminella* (a leaf miner).

As an Appendix to this account of the eight species of this Family known to occur in England, it may be serviceable to give a brief list of the other twelve which are met with on the continent.

In *Chauliodus* we have seven:—*scurellus*, H.-S., v, p. 208, 968; an Alpine species, occurring in Switzerland, the larva of which is still unknown: *strictellus*, Wo., S. E. Z., 1867, p. 209; larva on *Angelica montana*, but Mr. Stainton says that Mons. Constant in Provence finds the larva on the *seeds* of *Peucedanum* and *Ferula*: *æquidentellus*, Hofm., S. E. Z., 1867, p. 206; larva on *Meum athamanticum*: *iniquellus*, Wo., S. E. Z., 1867, p. 209; larva on *Athamanta oreoselinum*, but, according to Mr. Stainton, Mons. Constant in Provence finds the larvæ in the seeds of *Peucedanum*: *pontificellus*, H., 181, H.-S., v, 208; larva unknown, but suspected to feed on *Thesium montanum*: *ochreomaculellus*, Mill., Ann. S. E. F., 1854, of which the larva is unknown: *Staintoniellus*, Mill., Ic., xxiv; larva on *Osyris alba*.

Ochromolopis ictella, H., 361; larva on *Thesium montanum*.

In *Heydenia* four:—*statariella*, Heyd., S. E. Z., 1863, 108; larva on seeds of *Angelica*: *devotella*, Heyd., S. E. Z., 1863, 107; larva on seeds of *Angelica* and *Heracleum*: *laserpitiella*, Pfaff., S. E. Z., 1870, 322; feeding on *Laserpitium hirsutum*: *silerinella*, Z., Verh. Z. B., 1868, 119; on *Laserpitium siler*.

Hence it will be seen that all the known larvæ of the Family are nourished on plants belonging to the two natural orders *Umbelliferæ* and *Santalaceæ*.

Merton Cottage, Cambridge:
September, 1887.

ON THE LUMINOUS LARVIFORM FEMALES OF THE *PHENGODINI.*

BY PROF. C. V. RILEY, M.A., PH.D.*

Certain interesting phosphorescent Coleopterous larvæ, reaching $2\frac{1}{2}$ to 3 inches in length, had been well known to occur in America ever since Baron Osten Sacken first minutely described them in 1862, and discussed their affinities between the *Elateridæ*, *Lampyridæ*, and *Telephoridæ*.

The structural characters most peculiar to them are, the horizontal head, protruding labium; falciform, grooved, and untoothed mandibles inserted on sides of head; certain ventral conchoid depressions; minute dorsal stigma-like glands opening by a crescent slit between the joints; and the lateral spiracles.

The great interest attaching to these larvæ is not so much in their luminosity, as in the fact that a portion of them are now known to be true and perfect females of *Phengodini*, which have, until recently, been represented in Coleopterological collections in the male sex only. The history of this discovery furnished another instance of simultaneous and independent observations on the same point in different parts of the world.

In 1883, in connection with Mr. E. A. Schwarz, I had arrived at this conclusion in Washington, with the intention of some time publishing the facts upon which it was based, when the same conclusion was being verified by Dr. Hieronymus, of Cordova, and the announcement anticipated by him, and by Dr. Haase, in 1885.

I have been accumulating material since 1869, with notes, and have critically examined in all some thirty different lots in my own collection, at the National Museum, and in the collections at Philadelphia, Boston, and Cambridge. These all belong to *Phengodes* and *Zarhipis*, with the exception, perhaps, of Osten Sacken's No. 2, which may be *Spathizus*. The differences between the larva proper and the adult female are so slight that it were difficult to separate them without some absolute index. I have been fortunate in obtaining undoubted females, coupled with their males, of *Phengodes laticollis* and *Zarhipis Riversii*; and in both genera there were absolutely no other structural differences than the somewhat shorter (relatively) mandibles and tarsal claw in the adult.

In reference to life-history, the food of *Zarhipis* is known to be *Myriapods*; the eggs in both genera are spherical, translucent, and laid in masses in the ground; the newly-hatched larvæ in both are structurally identical with the parent; and the female larva goes through a pseudo-pupal state prior to the final moult.

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* Abstract of a Paper read before the British Association for the Advancement of Science, at Manchester, communicated by the Author.

Nothing is yet known of the male larva and pupa, and the author only conjectures that certain darker, more slender larvæ structurally identical, belong to this sex.

We have many forms of degradational females in *Hexapoda*, and we have true larval reproduction; but I consider that the females of the *Phengodini* offer the most remarkable instances of imaginal or adult characteristics associated with such truly larval characters. In this larviform female of these *Phengodini* we get a glimpse, so to speak, into the remote past, and from which has been handed down to us, with but little alteration, an archetypal *Hexapod* form, which prevailed before complete metamorphosis had originated; while, on the other hand, her male companion, during the same period, has developed wing-power, and the most elaborate and complex sensorial organs—the eyes and antennæ in these beetles being among the most complex of their Order.

Whether we believe the female *Phengodes* has never reached beyond her present form, *i. e.*, represents a case of arrested development, or that she has retrogressed from a higher type, where the sexes were more nearly alike, one thing is, I think, self-evident, viz., that there is direct relation between the phosphorescence and the remarkable differentiation of the sexes; and, further, that such relationship is explicable and full of meaning on evolutionary ground.

CONCERNING *ANOMALON TENUICORNE*, GR., &c.

BY JOHN B. BRIDGMAN, F.L.S.

On looking over my materials of what I considered this species, I have come to the conclusion either that *tenuicorne* is a very variable insect, or that there are several species mixed up under that name; this and *A. debile* are the only species of this group that I know of which have the transverse anal nervure divided; *debile*, Wesmael says, differs from *tenuicorne* in having the scape of antennæ fulvous, and the temples black, whilst *tenuicorne* has the scape black above, and the temples reddish; I found three varieties or species among my *tenuicorne*.

1. Two males and a female given to me some years ago by Mr. Bignell: they were bred from *Thais Polyxena*, brought, I think, by Mr. Mathew from Greece. These are larger than any British specimens I have; two are 18 mm., and the other

much smaller, is only 12 mm.; the males have the head much swollen behind the eyes, it is less so in the female; the transverse anal nervure is divided only just below the middle, and all the coxæ are black.

2. I have only one male of this form, which I believe is the true *tenuicorne*, The head is slightly swollen behind the eyes, and the transverse anal nervure is divided well below the middle, as figured by Wesmael (Revue des Anom. de Belgique).

3. This appears to be the commoner form in Britain. The head is decidedly narrower at the neck than against the eyes; the transverse anal nervure is divided below the middle, lower down than No. 1, and higher up than No. 2.

I can see no difference in the sculpture, it is possible that all are only varieties of one species; Holmgren says, "pleuris medio nitidis." I find the mesopleura is shining, punctate, with longitudinal rugæ above.

Mr. W. H. B. Fletcher has bred two males of this same group (having the antennæ as long as or longer than the body) from mixed larvæ from sloe, taken in Abbotswood, Sussex, which differ from the three species described, having the transverse anal nervure of the hind-wing not divided; from *brevicolle* they differ in not having the hind tarsi distinctly incrassated; the flagellum is entirely dark; and the hind-legs are dark brown, with tarsi partly pale. From *varitarsum* they differ in having the 1st joint of flagellum not more than one-fourth longer than the 2nd, in *varitarsum* it is about twice as long; the sculpture of the mesonotum is much finer, and it is much more distinctly trilobed; they differ from *flavitarsum*, Brischke, in the colour of the legs and antennæ, and in the sculpture of the thorax, which Brischke says is coarsely and densely punctured; below I give a description:—

ANOMALON NIGRIPES, *n. sp.*

Antennæ corporis longitudine, alæ nervo transverso anali non fracto pedibus posticis maxima exparte nigro-fuscis.

Head not narrow behind the eyes; antennæ as long as the body, first joint of flagellum not more than one-fourth longer than the second; head with very fine scattered punctures, finely rugose above the antennæ, and in the neighbourhood of the ocelli. Thorax somewhat shining, finely punctate, distinctly trilobed; scutellum somewhat depressed; metathorax rather finely reticulate; abdomen and legs slender, hind tarsi slightly thickened.

Black; face, mandibles, cheeks, a spot on vertical orbits, and scape beneath, yellow; antennæ black. Abdomen red, the back of all the segments black, the seventh entirely so. Front and middle legs yellowish-red, coxæ and trochanters yellow; hind-legs nigro-fuscous, apex of coxæ reddish, extreme base of femora reddish, middle of tibiæ rufo-fuscous, apex of first tarsal joint and remaining joints reddish.

Male. Length, 10—11 mm.

Norwich: *October* 31*st*, 1887.

NOTES ON *LEPIDOPTERA* OCCURRING IN THE ITALIAN LAKE DISTRICT.

BY ALBERT H. JONES.

I reached Lugano on the 30th May last. The weather was much warmer than in England, yet such species as *Lycæna Argiolus* and *Thecla rubi* were only commencing to emerge, being in the finest possible condition, their late appearance being probably due to the fact that the weather during the spring round the Italian lakes had been unusually cold.

It added much to the pleasure of my visit to have the company for a few days of Mr. Coryndon Matthews, of Ivy Bridge, who was engaged in collecting *Diptera.* We made the first excursion to Monte Salvatore, 2982 ft. high, clothed with wood almost to the summit. Few species of *Lepidoptera* appeared to be on the wing. *Venilia maculata* was disturbed out of the undergrowth, and in open spaces occasional specimens occurred of *Papilio Podalirius* and *Machaon, Argynnis Selene* and *Dia.*

The woods being apparently unproductive, we turned our attention to the meadows. Moths were scarce, but butterflies were fairly numerous, chiefly represented by the genus *Melitæa.*

An interesting form of *Melitæa Phœbe* occurred; *M. Didyma, Aurelia,* and *Athalia* were all somewhat plentiful: of the last-named I took two beautiful dark varieties.

In one particular meadow, which afforded Mr. Matthews an abundant harvest of *Diptera, Spilothyrus altheæ,* in beautiful condition, occurred frequently; here the local *Diasemia literalis* was to be seen flying in the bright sunshine among the long grass; *Melanargia Galatea* was very abundant on the 3rd of June, nearly all the specimens approaching var. *Procida,* and resembling on the wing a black butterfly, spotted with white; the *Lycænæ* were represented by *L. Icarus, Bellargus, Hylas, Argiolus, semiargus,* and *Cyllarus.*

At Stresa, on the South of Lago Maggiore, there was even a greater dearth of *Lepidoptera,* possibly owing to the excessive heat which prevailed. It seemed strange, as one strolled through the beautiful glades in the chestnut forests, to see only an occasional *Neptis Lucilla* or *Nemeobius Lucina.* In the meadows, by the lake side, *L. Astrarche* (the form occurring in England), *L. Lycidas,* a few, and *Polyommatus Dorilis* and *Phlæas* were to be found.

On the 7th of June, I started for an excursion up the Val Anzasca, the valley leading to the foot of Monte Rosa. The vegetation is very rich, and differs in some respects from that of the corresponding valleys north of the Alps, the large chestnut trees, extending up to nearly 4000 feet, being the chief feature.

At Ceppo Morelli, about half way up the valley, *Parnassius Apollo* occurred, most of the specimens, when flying, resembling red butterflies, from the under-side of the wings being covered with pollen of a red species of lily, on which the butterflies alighted. A very large specimen of *Saturnia pyri*, ♂, measuring 5½ inches across the wing, flew to the light in the hotel in the village, much to the astonishment of the visitors.

A little above Ceppo Morelli the somewhat local *Parnassius Mnemosyne* was very abundant, forcibly reminding one of *Aporia cratægi* on the wing.

As one ascended the valley, the *Apollos* disappeared, and were replaced by three species of *Erebia: Ceto*, *Medusa*, and *Evias* (all of which species I may mention I took last year in the valleys on the north side of Monte Rosa); also *Pararge Hiera* and *Œneis Aëllo*, which latter was in its usual tattered condition.

At Macugnaga, 5115 feet, so early in the year, there was naturally but little to be seen beyond a few *P. napi*, var. *bryoniæ*.

On returning to Stresa, on the 10th of June, several additional species were to be found in the meadows, among others, beautiful violet specimens of *Polyommatus Gordius*, and a few *Argynnis Adippe*, var. *Cleodoxa*.

On arriving, on the 12th of June, at Locarno, situated at the northern extremity of Lago Maggiore, another opportunity presented itself for seeking new species in a fresh locality, but a day spent in the woods was productive of but poor results, as I only succeeded in meeting with a few *Neptis Lucilla*, *Lycæna Orion*, *Cœnonympha Arcanius*, and a solitary specimen of *Vanessa polychloros*.

I made Bignasco, in the Val Maggia, my head quarters for a few days. The Val Bavona, which branches out of it, afforded good collecting ground as far as St. Carlo, at the head of the valley. In addition to many species already recorded, *Polyommatus Hippothöe*, var. *Eurybia*, and *Lycæna Eumedon* occurred not unfrequently. The beautiful *Syntomis Phægea* was common up to 5000 feet. *Vanessa Antiopa*, *Aporia cratægi*, *Leucophasia sinapis*, *G. rhamni*, were common all round the lake district.

The question to be solved is, why there should be such a far greater amount of "butterfly life" in the valleys than in the plains. I think it is due, in a measure, to the fact that the valleys during the winter months, say from 3000 feet, are covered with a considerable amount of snow, which affords to the hibernating larvæ great protection from their natural enemies. It is, however, quite out of my power to offer any explanation why there is such a preponderance of butterflies, and why the *Tortrices* and *Tineina* should be so poorly represented.

Shrublands, Eltham, Kent:
October 20*th*, 1887.

NOTES ON SOME VARIETIES OF *MELITÆÆ* FROM THE ITALIAN LAKE DISTRICT.

BY W. F. DE V. KANE, M.A., F.E.S.

Mr. Jones has allowed me to examine two very remarkable aberrant *Melitææ* taken by him at Lugano. If they had not occurred together, I should have been inclined to refer one to *Aurelia* and the other to *Athalia*.

The first one, from the size of such of its fulvous markings as are not obliterated, appears to belong to some of the intermediate forms between *Aurelia* and *Athalia*, and is somewhat larger than Swiss specimens of *Aurelia*. Exp., 1·4. Fore-wings dark sooty-black, with a single ante-marginal series of six small fulvous spots. Hind-wings unequal in size. Basal half black, with a median and two exterior fulvous bands of blotches.

On the under-side of one fore-wing, besides normal markings, is a median transverse band of wedge-shaped black blotches, increasing in size from the costa to the inner margin. Under-side of hind-wing strongly coloured and marked.

The other specimen measures 1·45. Fore-wings similar to the first, but the series of fulvous markings is much broader, being in fact a fusion of the normal marginal and ante-marginal series.

Hind-wings black, with only a marginal and ante-marginal series of fulvous spots. The under-side of both fore-wings has a median series of wedge-shaped dashes; and the hind-wings are also strongly marked, but the base and margin of one is darkly obscured.

This latter insect approaches nearly to the description of Selys-Longchamps' var. *navarina* of *M. Athalia*, and is of the same class of aberration above and beneath as figs. 3 and 5 in Newman's description of *Athalia* (Brit. Butterflies).

And as both specimens appear to be abnormal in either development or coloration, I think that they are the result probably to privation or peculiar experience in the larval condition, and are stunted forms of *M. Athalia*.

Two ♀ of *M. Phœbe* from North Italy, are of the South European type, without doubt, and have the pale fulvous ground-colour of the wings marked by a very slight black pattern. I have similar forms from Provence and Spain.

A third example presents a very handsome aberration.

Bases of all wings black. The rays and ante-marginal black lines on fore-wings broadly black.

On the hind-wing a broad black ante-marginal band, containing a row of darker spots where the ante-marginal fulvous blotches were obliterated.

Kingstown, Ireland:
October, 1887.

A MARINE CADDIS-FLY IN NEW SOUTH WALES.

BY ROBERT McLACHLAN, F.R.S., &c.

More than five years ago I published in this Magazine (vol. xviii, p. 278, May, 1882) some notes on a marine caddis-fly in New Zealand, and in the Journal of the Linnean Society, Zoology, vol. xvi, pp. 417—422, a more detailed account was given, with figures, the insect apparently being *Philanisus plebejus*, Walker.

Some time ago, Mr. A. Sidney Olliff, of the Australian Museum, Sydney, N.S.W., informed me that caddis-worms had been found between high and low water-marks in Sydney Harbour. More recently, he forwarded two cases with larvæ, and stated that they were from shallow rock-pools at Chowder Bay, Port Jackson, in January, between high and low water-marks, and that no fresh water stream exists in the locality. He said, furthermore, that the cases are familiar to shell collectors.

These cases are cylindrical tubes, 7 and 9 mm. long respectively, by about 2 mm. in diameter; the smaller one is very slightly curved, and somewhat attenuated gradually to the tail-end; the larger is nearly straight, and of nearly equal diameter throughout. The material consists of small irregular vegetable fragments arranged *en mosaique*.

The larva from the larger case is 7 mm. long, greyish-white in colour, but the head and pronotum slightly yellowish. The head is cut squarely in front, and the anal segment ends somewhat squarely, with very short anal claws. The division between meso- and meta-notum faintly indicated. No protuberances on the first abdominal segment. As the larva is only slightly attenuated posteriorly, the sides are nearly parallel, and the form is sub-cylindric, at present I can detect no trace of respiratory filaments. Anterior-legs very short, posterior rather long; the femora much thickened; terminal claw long and stout. (Mouth parts not at present examined; the mandibles are very short.) Altogether there is very much general resemblance to the New Zealand larva believed to be that of *Philanisus*.

The last remark is significant. After writing it, I proceeded to look over a beautiful series of *Trichoptera* given me by Mr. E. Meyrick. Amongst them is a specimen of *P. plebejus*, from Lyttleton, N. Z., and immediately below this (as placed by Mr. Meyrick) is a series of eight examples of a *Philanisus* from "*Sydney, N. S. W.*, 21/8/84." This is very important; it proves that *Philanisus* exists also in Australia; and it tends to prove that the marine larvæ found in Sydney Harbour are those of the *Philanisus** taken by Mr. Meyrick at Sydney.

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* Mr. Meyrick has kindly supplied the following particulars concerning this species:—"It "was common on the rock-faces in the Government Domain, Sydney, where there is a rocky "point jutting out into the sea, called 'Mrs. Macquarie's Chair.' I particularly noticed these "Caddis-flies from their position, because there is no fresh water near, save that after wet "weather the rock-faces become wet from the drainage through the stone from above. I there-"fore thought it quite possible they might be marine."

I conclude these notes by a consideration of the materials of which the cases are formed. In the New Zealand case, the materials were chiefly fragments of a *coralline* sea weed, but were evidently not so with those from New South Wales. I therefore submitted some small fragments of these latter to my friend Dr. M. C. Cooke, of the Kew Herbarium, for microscopical examination of cell-structure. He considers the fragments to be those of either *Ulva* or *Enteromorpha*; and he adds that both these genera are as much found in estuaries and far up the course of rivers as in the sea, and that they especially prefer *brackish* water. Mr. Olliff states emphatically that no fresh-water stream exists where the larvæ are found. If admixture of fresh-water be necessary for the larvæ of *Philanisus*, there remains a possibility that land springs, covered at high water, may exist on the beach where the shallow rock-pools occur. On this point I have asked for further information. In any case, the larvæ must be covered by the sea during half of their existence.

Lewisham, London:
November 5th, 1887.

Pseudopsis sulcata and Epuræa diffusa in Warwickshire.—In August last I captured a single specimen of *Pseudopsis sulcata* at the roots of herbage growing on the bank of a small stream at Knowle, and a few evenings later, on visiting a Cossus-infected tree at Solihull I found a few specimens of *Epuræa diffusa*, accompanied by numerous other sap-loving species, such as *Homalota cinnamomea*, *Hister succicola*, and *Soronia punctatissima*. The *Pseudopsis* and *Epuræa* are both new to the Birmingham District.—W. G. Blatch, 214, Green Lane, Smallheath, Birmingham: *October 9th*, 1887.

Coleoptera in Sherwood Forest.—During a short visit to Sherwood Forest in September, 1885, I found the following species (with many others) under bark:—*Prognatha quadricornis* (very abundant under pine bark), *Athous rhombeus* (oak), *Abræus globosus*, *Rhizophagus politus*, *Scolytus destructor*, *Tomicus laricis*. In the following June I captured in the same locality *Staphylinus fulvipes* (loose bark), *Philonthus bipustulatus* (bark), *Leiodes orbiculatus* (fungus), *Cossonus linearis* (oak bark), *Antherophagus nigricornis* (elder blossom), *Omosita depressa*, *Hister succicola*, and *H. merdarius*, the last three in dead sheep.—Id.

Langelandia anophthalma, Aubé, &c., in potatoes.—As I hoped, this interesting beetle has again appeared in my potato bed, and I have taken in all some fifty specimens, both in the decaying seed and in fragments of rotting wood. I also found two or three pupæ, which were white, semi-translucent, and almost exactly similar in form to the perfect insect. *Adelops* and *Anommatus* were in profusion, and I might have taken almost any number of either; seventeen of the latter once from a single potato!

In company with them were two specimens of the very rare *Bythinus glabratus*, Rye, one unfortunately so damaged as to be quite worthless. These seemed to prefer the semi-liquid matter of the decaying potato, whereas the other species all inhabit, as a rule, the drier substance near the skin. Among the other Coleopterous tenantry were several *Falagria thoracica* and *Oxytelus insecatus*, a few common *Homalotæ*, and a single *Ocypus similis*, whose errand was probably predacious rather than vegetarian. Accompanying these were a host of *Julus*, which, so far as my own experience goes, seem to do little real harm. As an almost invariable rule they confine their attacks to the seed potatoes, and the few fresh tubers in which I have found them were nearly all diseased.—THEODORE WOOD, St. Peter's, Kent: *October 3rd*, 1887.

Hydrophilidæ in the Armagh district.—In addition to those already communicated by me to the Rev. W. W. Fowler as occurring here, I have taken the following:—*Philhydrus maritimus*, two specimens at Lowry's Lough, *Anacæna limbata*, F., and *A. variabilis*, Sharp, both common; *Laccobius sinuatus*, *L. alutaceus*, *L. minutus*, and *L. bipunctatus*, of these the last is very much the most plentiful, of *minutus* I have only taken one specimen, *Limnebius truncatellus*, common, *L. nitidus*, scarce, *Helophorus æneipennis*, common, *H. arvernicus*, rather rare, *Octhebius bicolor*, only one specimen, *Hydræna riparia* and *H. nigrita*, both common, *Cyclonotum orbiculare*, one specimen, *Cercyon depressum*, one specimen, *C. hæmorrhous*, *C. unipunctatus*, *C. lugubris C. analis*, and *C. minutus*, all occur but sparingly. To the *Adephaga* list I may add *Chlænius nigricornis*, taken at Lowry's Lough and at Lough Neagh, *C. vestitus*, on Coney Island, Lough Neagh, *Bembidium punctulatum*, at Clay Lake, Keady, where I also took a number of *Pelophila borealis* and *Bembidium tibiale*. *Pterostichus minor*, *Anchomenus gracilis*, of which the Rev. H. S. Gorham kindly sent me types and enabled me to determine my specimens to be this species, *Amara aulica*, Panz. *Agabus unguicularis*, *Gyrinus marinus* and *G. minutus*, both these last in numbers. On Carlingford Mountain, Co. Louth, I took one specimen each of *Olisthopus rotundatus* and *Philhydrus melanocephalus*.—W. F. JOHNSON, Winder Terrace, Armagh: *September 15th*, 1887.

Sirex juvencus at Wotton-under-Edge.—On the 22nd September, a very fine female of this beautiful *Sirex* was observed flying about in a cottage garden, and captured and brought to me the same day for identification. The capture is worth recording, as the insect is undoubtedly scarce, in fact, this is the only instance I know of its occurrence in this part of the country.

The other species, *Sirex gigas*, is often met with, and has, in two or three instances, proved very destructive to the Deodar Cedars, which ornament our lawns and pleasure grounds.—V. R. PERKINS, Wotton-under-Edge: *October 10th*, 1887.

Simulium attacking larvæ in Japan.—I have called attention in the Proc. Asiatic Soc. of Japan to the fact that a minute Dipteron attacks the imago of *Stauropus persimilis*, the eastern form of *Stauropus fagi*, sucking its blood; it is a very minute yellow sand-fly, and I believe it to be a *Simulium*. I have now ascertained that this fly also attacks the larva of *Smerinthus planus*, the eastern form of *Smerinthus ocellatus*. I yesterday saw and examined under the microscope one of this fly, which had its proboscis buried in the back of a nearly full-fed larva of

Smerinthus planus. It has often been a matter of surprise to me to observe in the highest mountains, uninhabited by either man or beast, great swarms of *Simulium*, but if one species of these troublesome blood-suckers feeds upon other insects, the larger species may also do so.—H. Pryer, Yokohama: *September 7th*, 1887.

The larva of Terias Bethesba, O. Janson.—I have at last discovered the larva of this butterfly; during the month of August I observed in my garden many specimens of *Terias Bethesba*, and a fortnight ago watched two females depositing their eggs on *Cassia mimosoides*; this plant having pretty bright foliage, I had allowed to cover a small ornamental hill, and for some time noticed this butterfly frequenting this common weed. The larvæ are now full-grown; the following is a rough description:—Head globular, projecting, body uniform in thickness, tapering off abruptly; slightly pubescent; colour bright green, harmonizing with the colour of the plant; when young, it has a conspicuous pale yellow spiracular line, but before changing to pupa this line is white. The larva of *Terias multiformis* is very similar, the principal difference is that the colour is a shade darker green, and the spiracular line is always white, and when full-fed this line becomes indistinct.—Id.

P.S.—Referring to my note dated 7th inst., concerning the larva of *Terias Bethesba*, O. Janson, the imagines from their ova are just commencing to emerge, and instead of *Terias Bethesba*, they are all *læta!!* Accustomed as I am to the extraordinary "temperature" changes of Japanese butterflies, I can hardly conceive it possible that *Bethesba* and *læta* are one and the same species. There are, however, several suspicious circumstances: the first is that I know *Terias* to be a very short time in the ova, larva, and pupa stages; the second is that we now know that both *Bethesba* and *læta* feed on the same plant, *Cassia mimosoides*, there is no doubt concerning this; the third is that *Bethesba* only appears during the hottest months, July and August, and is absent during all the rest of the year, *læta* being only found during the intervening months, that is to say, it appears in September, and then hibernates in the imago during the winter, re-appearing in the spring; and, fourthly, I now remember that *læta* last spring was very abundant in my garden, which is a long strip, over an acre in extent, in precisely the same spot that I afterwards observed *Bethesba* in quantities. My friend, Mr. Nawa, of Gifu, a most enthusiastic entomologist, writes me under date of September 7th, received 10th, that he also had seen *Bethesba* depositing its eggs on *Cassia mimosoides*, but had not yet detected *læta*, for which he was on the look out; it remains to be seen whether his observations tally with mine in the result. I intend next spring to put the matter beyond doubt, by taking the same precautions as when rearing *Hecabe* and *mandarina*, and if it is a fact that *læta* and *Bethesba* are one and the same species, I venture to say it is one of the most extraordinary facts we are acquainted with in Natural History, as it would completely upset all hitherto known ideas concerning species, *læta* and *Bethesba* being entirely different in appearance and form, far more so than dozens of species of the allied genera; it is in fact an analogous case to planting a cherry stone, and finding a peach tree come up.—*September 20th*, 1887.

September 27th.—I was much surprised this morning on examining the breeding cage containing the pupæ from eggs laid by *Terias Bethesba*, to find an imago emerged, which strongly resembles *Terias Hecabe*, and which in the meantime I am led to believe is a hybrid. The only other conclusion that I can arrive at is that we have, in Japan, only *one* species of *Terias, i. e., multiformis,* which embraces *Hecabe, mandarina, læta,* and *Bethesba.*

The *mandarina* form are now emerging from *Hecabe* larva; this is the first time I have reversed the process, although I have often before bred *Hecabe* from eggs laid by *mandarina.*—Id.

Entomological Notes.—The following notes, suggested by reading the October and November numbers of the Ent. Mo. Mag., may prove of interest.

Pieris brassicæ and *rapæ* have been unusually abundant here this year.

I have seen *Sphinx convolvuli* several times in my garden, it would not look at verbenas or petunias, but showed a great partiality to the more gorgeous flowers of *Gladiolus.* I can confirm all that Mr. Barrett says about its noble flight, and the ease with which it may be observed.

Mr. Jenner's statement that, "partial migration, * * * * explains the occasional presence of great numbers (of insects) on the sea coast, as every movement in that direction is stopped, and the species becomes as it were heaped up there," was curiously illustrated by an occurrence that I witnessed in April, in the island of Teneriffe. Behind the town of Santa Cruz stands a range of mountains with a strangely sharp crest, near the summit the southern slopes are carpeted with a small bugloss (*Echium*) with brilliant purple flowers; on the north side of the ridge the ground falls suddenly away in precipitous crags, densely wooded with laurels and laurestinus trees, under the shade of which is the most exquisite fernery ever imagined. A strong wind was blowing from the north, which struck against the cliff, and was turned upwards by it: a large number of white butterflies, *Pieris Daplidice,* I think, impelled either by curiosity, a love of adventure, or of the beautiful, or what-not, kept flitting up these purple mountain-meadows, and making for the wooded crags; each as it reached the edge unsuspecting was cruelly swept up into the air, to a height of thirty feet or more, after a brief struggle it succumbed to *force majeure,* came down again and patiently began anew the ascent of the slope. Here the "heaping up" was literally effected; *P. Daplidice,* though common throughout the island, was nowhere so abundant as on this spot.

Many years ago, in the county of Durham, I remember seeing *Larentia didymata* flying freely over ragwort in bright sunshine, as recorded by Dr. Jordan, in Norway.

Although not to the point, I cannot refrain from alluding again to Teneriffe; on a rubbish-heap outside the town of Puerto Cruz, and also in a *stubble-field,* I more than once observed the gently-fluttering, crambus-like, flight of *Deiopeia pulchella*; on a tall, shrub-like, spurge (? *Euphorbia piscatoria*) the grandly conspicuous larvæ of *Deilephila euphorbiæ* were abundant in some places; on the snow-clad (in April) lava streams of the Pico del Teyde, Mr. Wainwright took a specimen of *Colias Edusa,* at a height of nearly 10,000 feet.—G. B. Longstaff, Morthoe, North Devon: *November 9th,* 1887.

Probable extinction of Callimorpha dominula at Dover.—For many years past this insect has been locally abundant from St. Margaret's Bay to Kingsdown, near

Deal; however, the falling of the cliffs and the predatory incursions of the numerous collectors of "*bizarre*" varieties, who search for the insect in all its stages, is rapidly decreasing its numbers. This summer I only noticed *two* specimens, sunning themselves on the leaves of *Eupatorium cannabinum*, instead of the thousands I have seen in former years. Although a Coleopterist, I could not help admiring this lovely Lepidopteron, and, at the same time, feeling sad to think that the time is not far distant (if the *amor habendi* of some Lepidopterists should continue) when *C. dominula* will disappear from this locality. I may here mention that one of the finest and most beautiful of the suffused varieties was taken by Mr. M. Ricketts, at St. Margaret's Bay, on the 6th July, 1882, and figured and recorded elsewhere.—C. G. HALL, 14, Granville Street, Dover: *November*, 1887.

Migration of insects.—Mr. Jenner's remarks (Ent. Mo. Mag., xxiv, 113) appear to explain the excessive abundance of particular insects during certain years in a far clearer light than has hitherto been done. Immigration has doubtless added many species to our lists, but surely when an insect appears in extraordinary numbers, immigration is not the only cause, nor the only answer we can give to this interesting enigma. Cold or heat, moisture or dampness, abundance or absence of parasites, surely these affect the scarcity or abundance of any insect more than immigration. Here, in Sheffield, we have had *Pieris brassicæ*, *napi*, and *rapæ*, in the utmost profusion this season; we are fifty miles away, as the crow flies, from the sea, and then there is the German Ocean to be crossed before the continent is reached. Could immigration, therefore, be the cause of this unusual quantity of butterflies? In 1877, *Colias Edusa* occurred plentifully in my father's grounds, about a mile from the centre of this town of smoke and dirt, would immigration be a satisfactory explanation of this? I think most of the readers of this Magazine will agree with me that it is most improbable, and that Mr. Jenner's supposition would be far nearer the real truth in explaining this interesting phenomenon than the theory of immigration. I may say, in conclusion, that the year in which *Edusa* occurred here so plentifully was a very dry one; connecting this circumstance with the fact that this summer, also an exceptionally dry one, has been the means of creating such an extreme abundance of three of our butterflies, we have a just cause to consider that a hot, dry season is favourable to the increase of insects generally, and a wet one the reverse. How heat or damp affects their parasites remains yet to be proved; but I should not be surprised if it were discovered that they could not withstand so great a heat as their would-be victims; for the absence of the cocoons of *Microgaster glomeratus* has been particularly noticed by me this summer, and, owing to the unusual appearance of its progeny's food, one would have expected a corresponding increase on the part of the parasite instead of the reverse, as has been the case here. Whether this supposition will hold good or not, however, remains yet to be proved.—A. E. HALL, Norbury, Pitsmoor, Sheffield: *October*, 1887.

Sphinx convolvuli in Co. Waterford.—A number of notices of the occurrence of *S. convolvuli* in various parts of England, and in one locality of Scotland, have appeared; and it strikes me it may be of interest to English and Scotch brothers of the net, as well as to Irish confrères (a union which I hope will never be repealed), to hear that this fine insect has also occurred in the Co. Waterford. I captured three specimens this year:—first, on the 4th September, over a bed of petunias; second, on the 10th, over verbenas; third, on the 11th, over petunias. On the 9th I saw one hovering over a bed of geraniums. All three were, unfortunately, not very good specimens, but this, I think, was greatly if not altogether due to the way that they buzzed and jumped about in the net. I have been much interested in reading Mr. Barrett's article (*ante*, p. 103). His observations on the habits of *S. convolvuli* quite agree with mine.—WILLIAM W. FLEMYNG, Clonegam Rectory, Portlaw, Co. Waterford: *November 2nd*, 1887.

Nepticula tormentillella in Yorkshire and Westmoreland.—It seems now to be generally accepted as a fact that the *Nepticula* referred to by the late Mr. John Sang, in the Ent. Mo. Mag., xxii, p. 138, is identical with the continental *N. tormentillella*; and I am informed by Mr. P. B. Mason, who has in his possession the few specimens bred by Mr. Sang, that such is undoubtedly the case. It was, therefore, with very great pleasure that, at the beginning of the present month, I met with the larva of this species on moors both in the West Riding of Yorkshire, and in Westmoreland. Unfortunately, I was rather too late to find more than a very few of the mines still tenanted, as nearly all the food-plant, *Potentilla tormentilla*, was brown and dead. I should imagine that this species, if properly searched for, would be found to be widely and pretty generally distributed on the high moors in the north of England, as I at once came across it on the only two bits of moorland which I searched, and, to judge from the number of empty mines seen, the larvæ must have been feeding in fair numbers a little earlier in the autumn.

The larva is a deep clear yellow, with the posterior portion of the dorsal vessel showing through as a darker line, and the head shining brown. It apparently begins to feed at the base of a leaflet, and gradually works on right round it until the whole leaflet is completely hollowed out and transparent, and the wanderings of the larva can only be traced by the lines of dark frass which mark its course.—EUSTACE R. BANKES, The Rectory, Corfe Castle: *October 20th*, 1887.

[*Nepticula tormentillella*, H.-S., of which a detailed description by v. Heinemann will be found in the Berlin ent. Zeitschrift., 1871, p. 213, has very narrow anterior-wings, bronzy-green at the base, with the silvery fascia considerably beyond the middle (v. Heinemann says between $\frac{2}{3}$ and $\frac{3}{4}$), preceded by a purple band, and the entire apical portion of the wing also purple; the head deep black. My own Dunkeld *Nepticula*, bred from *P. tormentilla* 27 years ago, has *no* purple before the silvery fascia, and the head is *not* black, but rather of a dull dark ferruginous tint. It will be of interest to learn when the perfect insects appear, whether the Yorkshire larvæ collected by Mr. Bankes produce the true *tormentillella*, or are identical with my solitary and nameless Dunkeld insect.—H. T. STAINTON: *November 14th*, 1887.]

A larval character peculiar (?) *to the Gelechidæ.*—In the course of some interesting notes in the November number, Mr. Fletcher alludes to his disappointment in mistaking the larva of a *Tortrix* for a *Depressaria*, and adds, "to my eyes many of the larvæ of these genera are much alike." The occasion, therefore, seems convenient for drawing attention to a very simple character, viz., an additional spot one on each side, on the back of segments 3 and 4, by which many of the larvæ of the *Gelechidæ* may, I believe, be known from other larvæ, whether belonging to the *Tineina* or the *Tortricina*. These spots are much smaller than the ordinary ones, and lie close to the middle line, interior to, and slightly in advance of, the first ordinary spot. It is now about two years since I first noticed these spots, and in the interval many larvæ have been examined; the result being, that whilst they have been present in every *Depressaria* and *Gelechia*, in which the ordinary spots were distinct, they have been absent, as far as I have seen, in all the others. Should further observation confirm this, a rather curious point will, I think, have been established, and one of some practical importance in a subject, where so much is difficult and obscure. I may add that these spots have already done good service by enabling me on more than one occasion to locate at once a new or half-forgotten larva.—JOHN H. WOOD, Tarrington, Ledbury: *November* 11*th*, 1887.

Note on Batrachedra pinicolella.—I have read Dr. Wood's account of the life-history of this species (*ante*, p. 126) with considerable interest, but was rather astonished to find it stated that its food-plant is the spruce (*Abies excelsa*), and not the Scotch fir (*Pinus sylvestris*), with which latter tree I had always thought it was connected. The insect is, in some seasons, not uncommon in this district, and from the circumstances under which I have sometimes taken the imago, I think it extremely improbable that its larva is entirely a spruce-feeder. On referring to my notes, I find that on July 5th, 1885, fifteen specimens were taken by beating Scotch fir, most of them being in fine condition. Now, the nearest spruce is quite half a mile distant from where I obtained these specimens. Hence it would seem by no means unlikely that in our district *Batrachedra pinicolella* is principally, if not entirely, a Scotch fir-feeder.—E. A. ATMORE, King's Lynn, Norfolk: *November* 8*th*, 1887.

Review.

REPORT OF THE ENTOMOLOGIST FOR THE YEAR 1886, by CHARLES V. RILEY M.A., Ph.D. From the Annual Report of the Department of Agriculture for the year 1886. With 11 plates. Washington: 1887, 8vo.

It is perhaps sufficient praise to say that the contents of this Report are as varied and exhaustive as are those of its predecessors. We can only allude especially to two articles. The first is on *Icerya Purchasi*, Maskell ("the cottony cushion-scale"), which is doing enormous damage in California, into which it is presumed to have been imported from Australia in 1872. Mr. Maskell has, in another place, detailed the ravages caused by it in New Zealand. Although there seems a probability that the natural food-plants are species of *Acacia*, it unfortunately shows itself capable of subsisting on almost any plant, and it is one of the very few *Coccidæ* that are active in all stages. The details for this are very full and interesting, and are illustrated by several plates, one of which is coloured. The male is a very extraordinary creature, and in its antennæ, and otherwise, differs greatly from that sex of most *Coccidæ*. In an appendix are given the results of no less than 156 experiments with various remedial agents, the preference being given to soap washes. The second article we propose to notice is that on "Buffalo Gnats," which, translated into scientific language, means species of *Simulium* ("Midges"). In our country the worst that can be said about our midges is that they are excessively irritating and annoying. In Hungary, &c., a species (*S. columbaczense*) has long been known to cause death in cattle and horses. In the United States there are two species that often cause great destruction to all kinds of domestic animals, the loss of stock thereby being sometimes enormous, and death in man also is said to have occurred. To realize this, one has to take into account the extent of the swarms of these minute pests, and the myriads attacking a single unfortunate animal. As in true gnats, &c., it is only the ♀ that sucks blood. As only a tithe of the ♀ *Simulia* can ever have a taste of blood, it has been surmised that this taste might, in some occult manner, benefit the race. Prof. Riley thinks otherwise, and opines that a ♀ gorged with blood dies almost instantly; what *may* be death to the attacked is certain death to the attackers. We would gladly notice other chapters in this valuable Report did space permit.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY: *October 27th*, 1887.—R. ADKIN, Esq., F.E.S., President, in the Chair.

Messrs. C. E. M. Ince and W. H. B. Fletcher, M.A., were elected Members of the Society.

Mr. C. A. Briggs exhibited dwarfed forms and varieties of *Lycæna Corydon*, Fb., taken this year. Mr. C. E. M. Ince, a variety of the under-side of *Argynnis Paphia*, L. Mr. Sheldon, living larvæ of *Eupithecia expallidata*, Gn., and *Aphomia sociella*, L., and a discussion ensued as to the hibernation of this species in the larval stage. Mr. Tutt, a cocoon of *Saturnia pavonia*, L., having two exits, there being only one pupa inside. Mr. Tutt stated that Mr. Clark, of Hackney, had met with a similar cocoon of *Bombyx trifolii*, Esp. Mr. Robinson, who was present as a visitor, *Tapinostola fulva*, Hb., *Plusia chryson*, Esp., and a specimen of a *Noctua* which Mr. Weir said was probably a variety of *Orthosia upsilon*, Bork. Mr. R. Adkin read "Notes on collecting at Eastbourne during August and part of September." At the close of the paper a discussion ensued, in which Messrs. J. J. Weir, Sheldon, Tutt, Cooper, Carrington, Tugwell, Wellman, and Billups took part.

November 10th, 1887.—The President in the Chair.

Messrs. A. M. Keay, J. H. A. Jenner, and A. Robinson, were elected Members.

Mr. J. A. Cooper exhibited a curious form of *Hadena dentina*, Esp., red forms of *Noctua glareosa*, Esp., a series of *Noctua castanea*, Esp., from Perth, and a series of *Tephrosia biundularia*, Bork, from Derbyshire. Mr. Oldham, a strongly marked variety of *Noctua baia*, Fb., &c. Mr. Tugwell, Irish, English, and Scotch forms of *Boarmia repandata*, L. Mr. Mera, fine varieties of *Arctia caia*, L., bred from ova hatched in June. Mr. Kenward also exhibited varieties of *A. caia*. Mr. J. A. Clark *Polyommatus Phlæas*, L. (bred), and contributed notes. Mr. Druce, a melanic variety of *Vanessa urticæ*, L., taken in Mexico. Mr. Sheldon, a long series of *Tephrosia biundularia*, Bork, from Derbyshire, and contributed notes. Mr. Tutt, specimens of *Dianthœcia compta*, Fb., from Germany, and a variety of *D. nana*, Rott., very closely approaching the specimens of *compta*. Mr. West (Greenwich), species of *Dytiscus*. Mr. Billups, *Astynomus ædilis*, L., *Strangalia aurulenta*, F., and *Nebria complanata*, L. Mr. Tutt read a paper on "Darwin's Theory of Hybridism."—H. W. BARKER, *Hon. Secretary*.

Entomological Society of London: *Nov. 2nd*, 1887.—Dr. David Sharp, F.Z.S., President, in the Chair.

Mr. Stevens exhibited a specimen of *Acidalia immorata*, L., purchased by him some years ago at a sale of the collection of the late Mr. Desvignes. Mr. Stevens remarked that two specimens of the insect lately captured near Lewes had just been described by Mr. J. H. A. Jenner as a species new to Britain.

Mr. Adkin exhibited, and made remarks on, a series of male and female specimens of *Arctia mendica* from Co. Cork; also, for comparison, two specimens of *A. mendica* from Antrim, and a series of bred specimens from the London district.

Mr. Enock exhibited a specimen of *Calocoris bipunctatus* containing an internal parasitic larva.

Dr. Sharp exhibited three species of *Coleoptera* new to the British list, viz.:—*Octhebius auriculatus*, Rey, found some years ago in the Isle of Sheppey, but described only quite recently by M. Rey from specimens found at Calais and Dieppe; *Limnius rivularis*, Rosenh., found by the late Dr. J. A. Power at Woking; and *Tropiphorus obtusus*, taken by himself on the Banks of the Water of Cairn, Dumfriesshire. Dr. Sharp also exhibited a *Goliathus* recently described by Dr. O. Nickerl as a new species under the name of *Goliathus Atlas*, and remarked that the species existed in several collections, and had been supposed to be possibly a hybrid between *G. regius* and *G. cacicus*. He also exhibited a living example of the Mole Cricket, *Gyrllotalpa vulgaris*, from Southampton; between the spines of its hind legs were a number of living *Acari*.

Mr. Eland Shaw exhibited two species of *Orthoptera*, which had been unusually abundant this year, viz.:—*Nemobius sylvestris*, from the New Forest, and *Tettix subulatus*, from Charmouth, Dorset.

Mr. E. B. Poulton exhibited the cocoons of three species of *Lepidoptera*, in which the colour of the silk had been controlled by the use of appropriate colours in the larval environment at the time of spinning up. He said this colour susceptibility had been previously proved by him in 1886 in the case of *Saturnia carpini*, and the experiments on the subject had been described in the Proc. Royal Society, 1887. It appeared from these experiments that the cocoons were dark brown when the larvæ had been placed in a black bag; white when they had been freely exposed to light with white surfaces in the immediate neighbourhood. Mr. Poulton stated that other species subjected to experiment during the past season afforded confirmatory results. Thus the mature larvæ of *Eriogaster lanestris* had been exposed to white surroundings by the Rev. W. J. H. Newman, and cream-coloured cocoons were produced in all cases; whilst two or three hundred larvæ from the same company spun the ordinary dark brown cocoons among the leaves of the food-plant. In the latter case the green surroundings appeared to act as a stimulus to the production of a colour which corresponded with that which the leaves would subsequently assume. Mr. Stainton suggested that larvæ should be placed in green boxes, with the view of ascertaining whether the cocoons would be green. He understood that it had been suggested that the cocoons formed amongst leaves became brown because the larvæ knew what colour the leaves would ultimately become. The discussion was continued by Mr. Waterhouse, Dr. Sharp, Mr. McLachlan, and others.

Mr. Klein read "Notes on *Ephestia Kühniella*," and exhibited a number of living larvæ of the species, which he said had been recently doing great damage to flour in a warehouse in the East of London.

Mr. A. G. Butler contributed a paper "On the species of the Lepidopterous genus *Euchromia*; with descriptions of new species in the collection of the British Museum."

Lord Walsingham communicated a note substituting the generic name *Homonymus* for the generic name *Ankistrophorus*—which was pre-occupied—used in his "Revision of the genera *Acrolophus* and *Anaphora*," recently published by the Society.

Mr. Waterhouse announced that at the December meeting he would exhibit a series of diagrams of wings of insects, and make some observations on the homologies of the veins.—H. Goss, *Hon. Secretary.*

ON A NEW SPECIES OF *HETÆRIUS* FROM TANGIER.

BY GEORGE LEWIS, F.L.S.

Mr. J. J. Walker captured, on the 14th March last, in the nest of a "bright red ant" at Tangier, a new species of *Hetærius* which is remarkable in having the hind angles of the thorax acutely produced, and it is the only Histerid in the Family in which this character is so conspicuous.

HETÆRIUS ACUTANGULUS, *n. sp.*

Breviter ovatus, brunneo-ferrugineus, sat nitidus; thorace dense ocellato-punctato, angulis posticis transversim productis; tibiis anticis aspere ocellato-punctatis. *Long.* 2·8 *mm.*

Head and thorax densely punctate, punctures ocellated, especially behind the neck. Forehead with two lateral striæ, which are feebly biangulate, and do not meet in front, but continue down part of the clypeus parallel to each other. The thorax is punctate throughout its entire surface, which gives an appearance of opacity, the anterior angles are obtusely produced and slightly reflexed, the sides are narrowly marginate and somewhat parallel for about three-fourths of the length, with the posterior angles produced and acuminate. There is a small rather transverse fovea at the base of the angle, and the scutellum is smooth and triangular. The elytra have three striæ, 1st complete, 2nd evanescent posteriorly, 3rd basal and short, the dorsal surface is punctulate throughout, with apices of the elytra clothed with erect hairs. Prosternum is broadly canaliculate, the canaliculation being shining, with a few irregular punctures, deep and somewhat narrowed in front, shallow and broad behind, and a little sinuate before the coxæ; the base is broadly emarginate, with the angles on either side produced somewhat acutely behind the coxæ. The sides of the thorax beneath are densely and ocellately punctured. The metasternum is finely and feebly punctulate and wholly depressed, the depression anteriorly being so deep that the mesosternum is inclined to be vertical. Propygidium and pygidium feebly and sparsely punctate, the first having erect hairs. The forelegs are opaque, roughly and densely punctate and ocellated, the second and third pairs are smoother on the inner surface, with the tibiæ very broad and nearly triangular.

This species resembles *H. Bedeli*, Lewis (Ent. Mo. Mag., vol. xxi, 1884, p. 83) in the dilatation of the tibiæ, but there the similitude ceases. In *Bedeli* the frontal stria is raised, nearly semicircular, and not interrupted in front, and the thoracic punctures are scattered irregularly and only a few are ocellated ; it is also sub-rotundate in outline.

Mr. Walker captured on the same day *Hetærius arachnoides*, Fairm., but this was associated with an "active slender black ant," and I regret I cannot at present give the specific names of the *Formicidæ*. There are now ten species of *Hetærius* known from the southern border of the Mediterranean.

Wimbledon :
November 15*th*, 1887.

NOTE ON SOME BRITISH *COCCIDÆ* (No. 8).

BY J. W. DOUGLAS, F.E.S.

(*Concluded from page* 101).

LECANIUM GIBBERUM.

Coccus gibber, Dalman, K. Vet. Ac. Handl. för 1825, p. 366, 4, tab. iv, fig. 6—12 (1826). Westwood, Introd. Mod. Class. Ins., ii, fig. 118, 18.

Lecanium gibber, Sign., Ess. Cochin., p. 252, pl. i, fig. 8, pl. xi, fig. 19.

♀. Irregularly spheroidal, the curve of the upper portion interrupted in the middle by a shallow yet wide longitudinal sulcation, thus causing on each side of it a rounded bulge or gibbosity, whence the curve of the sides is less than if the figure were a true spheroid ; the base is of considerable size, varying in form and dimension to fit the inequalities of the surface of the young terminal branch to which it is attached ; surface smooth, punctured round the base ; colour pale fuscous, with a median, indented, yellowish band ; eventually one of my two examples became reddish-brown. Antennæ (now first described) of six joints, in every respect precisely the same as in *L. fuscum* (*c. f.* fig.). Diam., 5, height, 4·50 mm.

Male unknown.

Dalman (*l. c.*) describes the species thus :—

"Femina vetusta valde turgida, gibba ; brunnea, lævis, nitida ; apertura retusa obovata.

"Superficies lævis, non vel obsolete tantum punctulata."

He states that the scales are found on aspen, birch, hazel, and other trees, and that their form varies much according to the configuration of the site. He gives several examples ; my two specimens agree best with his fig. 8, and with Signoret's pl. xi, fig. 19.

Signoret (*l. c.*) describes the single example he obtained from an alder tree in Austria, saying of Dalman's type—"Il forme une masse composée de deux boules réunies." He thinks that Dalman has confounded several species together, because there is too much difference among them to be considered as one only, more especially as they live on different trees.

My two examples came from the same oak, and were obtained at the same time, as *L. fuscum*, and were kindly forwarded by Mr. G. C. Bignell, of Stonehouse. In view of the many points of similarity, and the few of difference, I am very much inclined to believe that this is only a form of *L. fuscum*, which has already a variation from the type in an oblate-spheroid; but at present, having no absolute proof, this is merely matter of opinion.

ERIOPELTIS LICHTENSTEINII, Sign.

In his "Essai sur les Cochinelles," p. 445, Dr. Signoret has the following:—

> "Among the numerous examples of *Eriopeltis festucæ* that we have collected at Hyères, or that we have received from M. Lichtenstein, who had gathered them at Montpellier, we have always observed that there were two very distinct types—one having a sac with curly woolly filaments, almost scaly, the other, on the contrary, having a sac very densely felted. Having also received some large examples sent by M. Ritsema from Holland, we have thought it right to consider the last form as a new species, which we have named *Eriopeltis Lichtensteinii* (Bull. de la Soc. entomol., Feb. 14th, 1877, p. 47), reserving the name *festucæ* for the typical species of Boyer de Fonscolombe, which we possess, and which has the curled woolly sac.
>
> "The necessary microscopic study would at present take up too much of our time, and it will form the subject of a more extended note hereafter."

Fonscolombe's species herein alluded to was described in the "Annales Soc. Ent. France," iii, 216, pl. 3, fig. 9, thus:—

> "Son corps est ovale, allongé, entièrement couvert d'un fourreau blanc cotonneux, dont les poils sont hérissés en dehors, l'intervalle entre le corps et le coton est ordinairement rempli de quantité de petites larves d'un rouge foncé qui courent assez vite, quand on met à découvert le corps de la mère en mai; on le trouve aussi l'été, et toujours le long des feuilles et des tiges du *Festuca phœnicoides* et du *F. cæspitosa*, Desf."

In this Magazine, vol. xxii, p. 141 (1885), Mr. G. C. Bignell informs us that on the 22nd July, 1885, near Whitsand Bay, Mr. J. Scott, in his presence, found on *Festuca bromoides* two sacs of an *Eriopeltis*, both of which were sent to me; one of them produced a male, the other was full of eggs. On the 3rd August, at Bickleigh, other cases were found on the same kind of grass, and were forwarded to me: like those first sent they were the felted form and full of eggs. Mr. Bignell says of them, "Scott and I obtained several females, clothed in white cotton, but not to such an extent as when taken in October; these were obtained low down on the stems, those found at the end of September and during October are well up from the soil and very conspicuous." Some of these latter, three times larger than the first found, were also sent to me, and were of the long curly-wool kind. Subsequently Mr. C. O. Waterhouse gave me three examples of the large white ♀ sacs which he obtained at Folkestone Warren and exhibited at the Meeting of the Entomological Society, Feb. 3rd, 1886 (Trans. Ent. Soc., 1886, Proceed., p. 1), and these are of the same kind as those found at Bickleigh in October.

We have then both of the forms of sac noticed by Signoret; the large long-wool one which he refers (and I think correctly) to *Eriopeltis festucæ*, Fonsc.; the smaller, felted, short-wool one is the *E. Lichtensteinii*, Sign. I cannot find that Signoret ever made his promised investigation, which is to be regretted. He may be right in his suggestion of two species, but the conclusion I arrived at, pending further elucidation, was that the felted sacs found in July are either the same as the long-wool ones found in October, but abraded during the winter, or, more probably, that they have been produced after hibernation from the eggs contained in the latter, and are the growth of the year; this latter proposition is more consonant with the economy of the *Lecanina*. The question is open for future investigation; in the mean time we have, nominally, two species.

LICHTENSIA VIBURNI.

Lichtensia viburni, Sign., Ess. Cochin., p. 204, pl. x, fig. 7 and 7*a*.

Larva-scale pale citron-yellow, oval, flat, with a long median fusiform space, and four (two on each side) slight anterior lateral carinæ.

Length, 2·25, breadth, 1 mm.

♂ scale (the larval covering having been thrown off) whitish, transparent, long-oval, the median space as in the larva, but dark or brown and opaque, with slightly raised edges; from its anterior end two strong carinæ proceed obliquely to the margin in a V-form, and on each side two slighter carinæ, of which the one is about the middle, the other posterior; all the carinæ white.

Length, 2·25, breadth, 1·50 mm.

♂ imago orange-yellow; head, and anterior and posterior margin of the thoracic depression broadly, pale brown, or the head dark brown; eyes and ocelli black; antennæ yellow, very hairy, of ten joints, 3rd to 6th long, sub-equal, the others short; wings whitish, transparent, along the radial nervure roseate; halteres short, with one terminal hair; the body with two long white terminal filaments; legs dingy brownish. Exp. of wings, 3 mm.

♀ adult scale pale citron-yellow, ovate, flat-convex, an indistinct longitudinal row of short, transverse, light brownish marks on each side of a narrow, clear median space; surface (under a lens) finely punctate, more strongly, or even crenate, on the brownish marking. Under-side all pale. Scale finally covered with a cottony pellicle. Antennæ of eight joints, the first two short, 3rd longest of all, 4th and 5th sub-equal, shorter than 3rd, 7th shorter, 6th and 8th nearly equal, the latter with gradate sides, and hairy. Length, 3·50—4·50, breadth, 2·40—3 mm.

At the end of April Mr. G. C. Bignell, Stonehouse, Devon, sent me some leaves of ivy (*Hedera helix*) from plants growing against an adjacent garden wall, on the under-side of each of which were many (sometimes a dozen) scales, evidently of a *Lecanid*, much resembling those of *Lecanium hesperidum* in the young state; they appeared to be fixed, but I soon found that they moved about, and were in the larva condition. I despaired of rearing them on the detached leaves, and put them on ivy growing in the garden, but they did not take to the leaves, and perished.

At the end of May and on June 6th Mr. Bignell sent a further supply of ivy leaves with scales attached; nearly all of them were those of males, but the majority were empty, the perfect insect having emerged, but I was pleased to obtain seven or eight of the imago within a few days.

There were also some six or seven adult female scales, as described above. Up to this time everything pointed to the species being a *Lecanium*, but I had seen on two of the leaves small cottony masses which might have formed part of the ovisac of a *Pulvinaria*, and I thus suspected that the insects before me might possibly be of that genus. I was, however, surprised on June 7th to find that two of them had within a few hours completely *covered* themselves with a thin white pellicle thinly overlaid with cotton-like material, closer and more flocky on the sides towards the margin, but no visible ovisac. I then found that on account of this peculiarity of a species discovered by M. Lichtenstein at Montpellier on leaves of laurustinus (*Viburnum tinus*) being discordant with the genus *Pulvinaria* (which has only an inferior and posterior ovisac), and also with *Phillippia* (which makes an entire sac-envelope for itself, and of which the antennæ of the female have only six joints), Signoret (*l. c.*) had constituted for it the genus *Lichtensia*, thus characterized :—

> " ♀ flattened, having eight joints in the antennæ, and having, at the adult stage of life, after fecundation, a cottony pellicle which completely covers her, except at the part where she is fixed to the plant, the eggs laid in a cottony mass."

The species I now have, evidently of this genus, does not differ from Signoret's description of *L. viburni*, except in some small points; thus he does not mention the faint brown marking of the scale of the ♀, and he gives the 7th joint of the antennæ as the shortest, which I do not perceive, he also says there is a nebulosity along the radial nerve in the wings of the male, while mine has a roseate hue there, but I do not think that, in view of the close agreement in the majority of characters, these small differences are sufficient to constitute a distinct species. The greatest discrepancy in connection is the food-plant, but among the *Coccidæ* such variation of the food often happens and is not of itself of specific importance. Mr. Bignell informs me that there are no bushes of laurestinus near the place where the ivy grows.

It should be noted that the white eggs are laid under the maternal coverlet. One ♀ I saw walking about after the development of the cotton on the sides had begun.

The genus and species (the latter the only one known) are new to Britain.

With the larval scales were a great many others, oval, very convex, blackish in the middle, brown at the sides, each containing a pupa of a Hymenopterous parasite, which had eaten up and taken the place of the larva of the *Lichtensia*.

ORTHEZIA INSIGNIS, *n. sp.*

♂ (Fig. 1). Piceous-black. Head small, convex, exserted; eyes and ocelli evident. Antennæ (Fig. 2) long, pale, with blackish spots or clouds, furnished with strong, outstanding hairs; composed of nine joints, exclusive of a large antenniferous process simulating a joint, 1st joint stout, sub-clavate, end rounded, 2nd cylindrical, longest of all, the remainder oblong, with obtuse ends, but the last is more pointed, all in length subequal. Thorax large, convex, prominent and rounded in front, the disc with a large, wide and deep depression; scutellum with a large median hollow. Wings broad, ovate, diaphanous, iridescent; the furcate nerve scarcely darker. Halteres (Fig. 4) short, fine, straight, of one joint, with one apical seta. Abdomen slender, tubular, the external margin of the segments bluntly dentate; from the last segment on its lower side, closely posterior to two round tubercles, arise two white, projecting, setaceous filaments, longer than the body; being covered with cereous matter they become cylindrical, but if denuded they appear as brown setæ, and each splits into two; genitalia as shown in the Fig. 3, on the under-side of a long-cordate form. Legs pale, with dark obscurations, and strong projecting black hairs; tibiæ long; tarsi about one-fourth the length of tibiæ, with one claw.

Length of body, 1 mm.; exp. of wings, 2 mm.

Fig. 3.

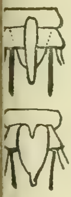


Fig. 2.

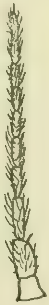
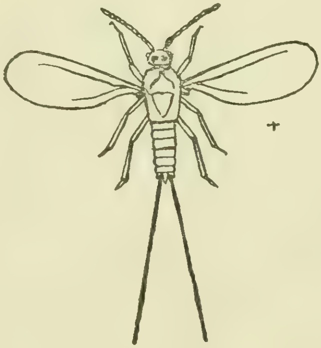


Fig. 1.



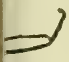


Fig. 4.

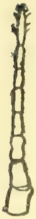


Fig 3.

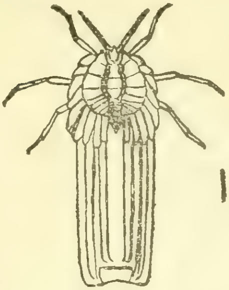


Fig. 1.

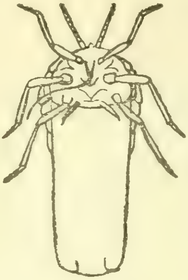


Fig. 2.

♀ (Fig. 1). Head small, eyes prominent, rostrum thick, conical. Antennæ (Fig. 3) fulvous, short, tapering, of eight joints, the 1st thick, sometimes infuscate, 2nd to 7th constricted beyond the middle so as to simulate two joints, the 8th long, slender, pointed, black. Body (including the thorax) piceous-black above, short-broad-oval, surrounded (except over the head) by a marginal series of snow-white, laterally connected, lamellæ, which, after the first three on each side, are directed backwards and downwards, gradually increasing in length, the posterior ones overhanging the marsupium; but of these the middle three are shorter and more distinct, the median one, over the middle channel, shortest and broadest of all, either turned up vertically or horizontal and having a median sulcation; the dark surface of the body level, nude, the segmentation plainly discernible, but on the middle are two longitudinal, narrow, contiguous yet distinct lines of small, granulose, white lamellate projections. These lines, beginning at the base of each antenna, extend backward, for a short distance convergently, but almost immediately after each curves outward and again inward, so as to leave a small, dark, oval space between them, then both are parallel and close together up to the anal extremity. Marsupium snow-white, varying in length, margins straight, parallel; the upper-side shorter than the lower, longitudinally canaliculate, the median channel wide, two others on each side of it very narrow, and further down on the rounded sides are usually slight striate indications of one or two more channels: under-side (Fig. 2) shining, semi-tubular, being transversely very arched, smooth, with the faintest traces of transverse indications of the progressive stages of development; posteriorly curved upward, apex truncate, but the lateral angles produced. Legs fulvous; thighs darker; tarsi monomerous, not one-third the length of the tibiæ; one terminal claw.

Length of body, 1 mm.; with marsupium, 2—4·5 mm.; maximum breadth of marsupium, 1·5 mm.

This remarkable species is distinguished from all others hitherto known by the male having only two anal filaments instead of a fascicle of them, and by the female having the whole dorsal surface free from cereous covering, except the two narrow, median, white, projecting lines. Some of the joints of the antennæ of the male, when the insects were fresh, if viewed from the side, appeared to be flattened, but Mr. G. S. Saunders (to whom I am indebted for the figures) says on this point, "I mounted three males in balsam after soaking them in water, spirit, and oil of cloves, and the antennæ and legs have now assumed their normal form."

In August Mr. Edward T. Browne, Uxbridge Lodge, Shepherd's Bush, sent me several examples of this species, which he had obtained in the Royal Gardens at Kew, requesting that I would describe it if new, and he added the following particulars: "First found on *Strobilanthes*, a Chinese plant, which has been in the Economic House three years; it may now be seen in the adjoining house on other foreign plants. Winged males numerous, but hard to catch; females very abundant and easily obtained."

8, Beaufort Gardens, Lewisham:
September, 1887.

THE LARVA AND CASE OF *ITHYTRICHIA LAMELLARIS*, EATON, WITH REFERENCES TO OTHER SPECIES OF *HYDROPTILIDÆ*.

BY KENNETH J. MORTON.

Another gap in our knowledge of the life-history of those minute *Trichoptera*, the *Hydroptilidæ*, has been filled up by the discovery of the cases of *Ithytrichia lamellaris*, Eaton, a further result of the good work of Mr. Bolton. I have had the opportunity of examining cases containing both larvæ and nymphs, and propose to give some notes, which will serve for purposes of identification. The subject, however, deserves much further study; the larva, especially, possesses points equalling in interest anything that I have met with amongst *Trichoptera*, the form of the external respiratory apparatus being quite novel for the Order, and presenting some analogy to that found in the Ephemerid nymph.

The cases are made of the usual transparent material. Those of the larva have the outline oval, with a deep excision at the mouth end; towards the other end the sides come close together, the vent being in the form of a slit. The appearance of the nymph case is different, and it might well be held to belong to another species. But a close examination reveals the original case; the mouth end (or what was formerly that) has been supplied with an elongate stopper, and the other end has also been slightly produced by the addition of more material. The cases are fixed to the stems, &c., of water-plants,* and, as has been already hinted, the head of the nymph is turned towards the broader end.

In form, the larva departs entirely from the Hydroptilid type, and instead of being obese, it is rather slender, and so transparent that it is a splendid subject for miscroscopical examination, the organs

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* *Myriophyllum* is a favourite; at Killarney I found attached to it cases of both *Agraylea* and *Oxyethira*.

of the alimentary and other systems being clearly visible. The head is elongate, with eyes placed about the middle of its length; it becomes narrower towards the mouth; behind the eyes it contracts a little, then the sides run almost parallel; antennæ long, at least two-jointed, the second joint one-third the length of first; a few long hairs scattered over the head (mouth parts I cannot separate). Thorax with three segments chitinous above, covered sparsely with long hairs; posterior legs rather long. Abdomen with four of the segments (I think, 3rd to 6th) produced into large protuberances; to these are attached by short pedicels the foliaceous branchial tracheæ (fig. 1). These protuberances are the most opaque parts of the body, apparently on account of the collection therein of the bulk of the "fat-globules." In the following segment, the form of the branchial tracheæ is different; they are triangular processes arising directly from the segment without constriction (fig. 2). At first I considered the position of these organs lateral, but after taking the larva out of the case, I am now almost sure it is dorso-ventral.

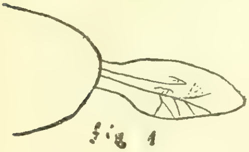

fig 1

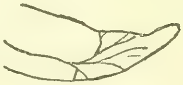

fig 2

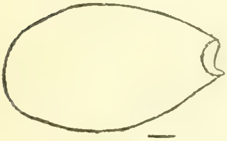

fig 3

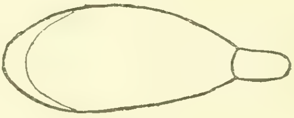

fig 4

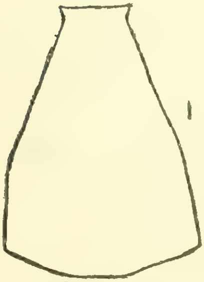

fig 5

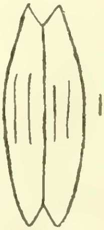

fig 6

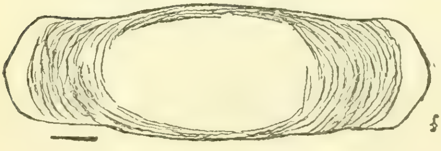

fig 7

Among Pictet's figures, the case of *Ithytrichia lamellaris* agrees most closely with fig. 13, pl. xx (without name), but the larva associated with it gives no indications of the protuberances, being of the usual stout form, although in the description the segments are said to be "découpés."

The accompanying outline figures will serve to show the diversity which exists in the cases of the British *Hydroptilidæ.* Figs. 3 and 4 represent respectively the larval and nymph cases of the subject of the present notice; fig. 5, larval case of *Oxyethira costalis*; fig. 6, larval case of *Orthotrichia angustella* (?); and fig. 7, larval case of *Agraylea multipunctata.* In addition to these, there is the case of the true *Hydroptilæ*, more or less reniform, and differing from the others in being covered with minute grains of sand.

Carluke, N.B.:
November 22nd, 1887.

P.S.—I have just received the Entomol. Nachrichten for November, containing a paper by Dr. Fritz Müller, entitled, "Eine deutsche *Lagenopsyche*," in which he describes a case at first referred to *Lagenopsyche* (on account of its resemblance to Brazilian cases so named by him), but now held by him to belong to *Oxyethira*, and probably to *O. costalis.* He does not appear to know that *O. costalis* has been bred in this country, and the cases noticed by Mr. McLachlan and myself (Ent. Mo. Mag., vol. xxiii, pp. 17 and 201). In my notes I quoted Müller's description of the case named *Lagenopsyche* to give a better idea of that of *O. costalis*; he says that save in the matter of colour, the description of the subject of his paper in the Entomol. Nachrichten agrees word for word with that of the cases he formerly named *Lagenopsyche.* Although Dr. Müller's figure differs from mine slightly (the only case I have now is in balsam, and possibly altered a little from pressure), I have no hesitation in referring it to *O. costalis.*—K. J. M.

Neuronia clathrata, Kol., reported from the London District.—A short time ago I noticed at Mr. Doncaster's in a box of miscellaneous and mostly very common British insects, two very fine examples of this pretty and rare British caddis-fly. The few British specimens known to exist had come from certain woods in Staffordshire and vicinity. I asked Mr. Doncaster to obtain further information as to the locality of these two specimens. He says that all the insects in the box were taken by Mr. Boden, a London collector, and the latter assures him the caddis-flies were captured in the Tottenham Marshes some three years ago. Supposing no error of memory to have occurred, this is very interesting. There is a parallel to it, for the unique British example (now destroyed) of *Agrypnia picta* (a near relative of *Neuronia*) was taken on a gas lamp at Highgate by Mr. H. Pryer, now of Japan, in June, 1868 (*cf.* Ent. Mo. Mag., vol. v, pp. 125 and 143).—R. McLachlan, Lewisham: *December 7th*, 1887.

AËPOPHILUS BONNAIRII, SIGNORET.

BY JAMES H. KEYS.

On the 7th of November I found a larva of this Hemipterous insect on the shore here, when hunting for the Coleopterous *Aëpus marinus*, but I regret to say that I cannot give any particulars likely to throw light on the insect's life-history. It was taken in the act of crawling about the under-side of a flattish stone, about 10 inches square by 2 inches thick. There were no sea-weeds attached to the stone, nor any growing within eight inches of it; and beneath it there was the usual composition of beaches in this neighbourhood, consisting of sand, gravel, stones of various sizes, and a sprinkling of limpet and other shells. The beach is very rocky, some of the rocks running into the sea much beyond low-water mark, and others terminating at different points above it; the beach is, moreover, strewn with large stones and boulders, some of which could not be moved without the aid of a lever. Speaking generally, the stones and rocks are densely clothed with the common *Fucus*. The situation of the stone under which I found the larval *Aëpophilus*, was about 37 feet from dead low-water mark, as nearly as I can calculate.

Whilst ascertaining this fact, on the 4th inst. I busied myself with further search for *Aëpophilus*, as did also my brother, who accompanied me, and his diligence was rewarded by turning up a mature specimen. This one was found about a dozen feet further up the beach than the first example, but under precisely similar circumstances, excepting that the stone under which it was found was nearer to the sea-weed-covered rocks, the lowermost plants resting on the stone.

I purpose continuing my attention to the habitat of *Aëpophilus*, and trust to be able to obtain more definite information respecting its habits. I did not observe any *Aëpus* under the stones with either specimen of *Aëpophilus*, although examples of the former were frequent in the immediate neighbourhood.

8, Princess Street, Plymouth:
December 5*th*, 1887.

[The foregoing information, coupled with that afforded by the experience of Mr. E. D. Marquand, who found matured *Aëpophilus* on a star-fish (Ent. Mo. Mag., xxiii, 169), tends, I think, to show that the insect feeds on sub-marine animal matter. Besides the elucidation of this subject, great interest will attach to the discovery of the way in which respiration in this insect of a terrestrial exterior form is carried on during the long portion of its existence when submerged. Observation of living examples in an aquarium might possibly determine both questions.—J. W. D.]

A YEAR'S INSECT-HUNTING AT GIBRALTAR.

BY JAMES J. WALKER, R.N., F.E.S.

The insect fauna of the south of Spain has been investigated by such well-known Entomologists as Rambur, Graslin, Rosenhauer, Dieck, &c.; but, as far as I have been able to ascertain, nothing has been published respecting that of our British possessions at Gibraltar and the immediate neighbourhood, except some notes on the butterflies in the "Entomologist" (Nos. 246 and 247, Nov. and Dec., 1883). As I have had ample opportunities of collecting in this very interesting locality since my appointment to H. M. gunboat "Grappler" stationed here, I venture to put my experiences on record, as a contribution to the knowledge of the entomology of this extreme southern corner of the European continent, prefacing them with a brief account of the chief physical and botanical features of the district.

The Rock of Gibraltar is a huge isolated mass of hard greyish-white limestone of Jurassic age, about 2½ miles in extreme length, with a varying width, at the sea-level, of from 440 to 1300 yards. A level sandy isthmus, scarcely ten feet above high-water mark in any part, connects it with the Spanish mainland, and from this the northern face of the Rock rises in one magnificent vertical precipice to a height of over 1200 feet. Thence, for rather more than a mile, the crest of the Rock is a narrow knife-edged ridge, running nearly north and south, and varying in height from 1356 feet near the north end, to only 660 feet at less than a quarter of a mile south of this point. It again rises to 1275 feet at the Signal Station, near the middle of the ridge, and attains its greatest elevation (1396 feet) between this spot and "O'Hara's Tower," which surmounts its southern extremity. From here the Rock descends in a series of grand precipices to the "Windmill Hill Flats," some 400 feet above the sea, and again sinks abruptly to Europa Point, which presents a cliff of about 50 feet high to the Straits. Except at "Catalan Bay," where a short sandy beach affords a site for a little village, chiefly inhabited by Genoese fishermen, the east side is quite inaccessible, being a succession of immense slopes of loose sand and gravel, standing at a steep angle, and crowned by vertical walls of rock, or else rising in an unbroken precipice from the waters of the Mediterranean. The west side, although very rugged and in many places quite precipitous, is, on the whole, of a comparatively easy slope, and several good paths lead to the summit.

Although the actual height of the Rock is quite insignificant, it can scarcely be surpassed in the striking grandeur of its appearance, and from its summit may be obtained, on a clear day, a most extensive and charming view, embracing the whole of the Straits, and the Mediterranean shores nearly as far as Malaga, with a glimpse of the distant "Lesser Atlas" in Morocco. From its abruptness and isolation, the Rock is a great "weather-breeder," and when an easterly wind or "Levanter" prevails, as it does throughout most of the summer, the top is hidden for days together by a heavy pall of misty cloud stretching far across the Bay, while the sun is shining brightly over the adjoining country. Though the town, situated at the western foot of the Rock, is exposed to the full influence of the afternoon sunshine, the summer heat is never excessive, rarely exceeding at any time 85° in the shade. February is the coldest month, frost and snow beng very rare, although not quite unknown. The average annual rainfall is about 36 inches, nearly all occurring between October and April: by the end of August the whole country, unrefreshed by a shower for the past three months, becomes as dry and brown as a high road. In this genial climate some of the butterflies continue on the wing the whole year round, and there is scarcely a sunny day in any month on which specimens of *Pieris brassicæ** and *rapæ*,* *Colias Edusa*,* *Satyrus Ægeria*,* *Pyrameis cardui** and *Atalanta*,* and *Chrysophanus Phlœas*,* may not be met with in sheltered places.

Much of the western side of the Rock, above the town and its fortifications, is covered with a dense bushy vegetation, most luxuriant towards the southern end near the summit. The flora of the district is, indeed, by no means a scanty or insignificant one, no fewer than 484 species of flowering plants being enumerated by Dr. Kelaart (Flora Calpensis, London, 1846) as occurring on the Rock itself and the small adjoining piece of sandy ground extending to the Spanish lines: of these some 32 are introduced or cultivated, leaving the large number of 452 native to Gibraltar. The dwarf palm, *Chamærops humilis* forms a conspicuous feature in the vegetation of the Rock, and in the early spring months of February, March, and April, the abundance and beauty of the wild flowers (*Boragineæ*, *Compositæ*, *Labiatæ*, *Orchideæ*, and *Liliaceæ*, predominating) is very striking. One very pretty Crucifer, the *Iberis gibraltarica*, of Linné, has its only European station here, its large lilac flowers adorning the rock-faces in April and May, and, earlier in the year, the trefoil leaves and golden yellow blossoms of *Oxalis cernua*, Thunb., an introduced Cape plant, cover large spaces on the lower slopes. At the back of the Alameda, or public garden, is a good sized grove of Scotch firs, but on the whole, trees are rare, except in the gardens, and planted along the road sides.

In these situations may be seen fine examples of the plane, the acacia, the white poplar, the locust tree (*Ceratonia siliqua*, L.), the Australian blue gum (*Eucalyptus globulus*), the graceful *Schinus molle* of the Andes, here called the pimienta or pepper tree, and the Chinese *Phytolacca dioica*, or "bella sombra," remarkable for the immense enlargement of its soft-wooded trunk just above the root: with the usual South European fruit trees, and an occasional date palm, the fruit of which, however, rarely, if ever, ripens here. The prickly pear (*Opuntia*) and the *Agave americana* are thoroughly naturalized, and are much used in the neighbourhood to form hedges.

As is well known, the Rock is the sole European locality in which the Barbary ape (*Macacus inuus*, L.) is found in a wild state. These animals, reduced a few years ago to less than a dozen individuals, have of late increased greatly in numbers, and, being strictly protected, are very bold and fearless. The fig trees in the gardens suffer so much from their depredations when the fruit is ripening, that it is found necessary to employ men to scare them away. The Barbary partridge (*Caccabis petrosa*, Gmel.), though numerous on the Rock as well as on the opposite African coast, is, like the monkey, found nowhere else on the European continent. The osprey, the peregrine falcon, the Egyptian vulture, and Bonelli's eagle (*Nisaëtus fasciatus*, Viell.), breed sparingly on the higher crags. A very great number of species of fishes is found in the Bay and the adjoining waters, and a visit to the market, especially in the early morning, rarely fails to reward the naturalist with the sight of many interesting and often rare forms.

Leaving the town by the "Landport" gate at the north end, a short walk brings one to the flat, sandy isthmus, of which the British lines enclose a strip, from sea to sea, about a quarter of a mile long, used as a race course and rifle range; a similar strip between the British and Spanish lines being "neutral ground." When I was here in 1874—5, the race course was marked out with large loose stones, under which *Coleoptera* congregated in myriads, but these have long since been removed, much to the detriment of collecting, still, the abundance of large beetles here is very striking at all times of the year, but especially in the spring and early summer. The big, unwieldy *Morica planata*, F., *Pimelia fornicata*, Sol., and *Akis acuminata*, F., are to be seen everywhere waddling clumsily about, and a little closer search will not fail to reveal *Scaurus tristis*, Ol., and *punctatus*, Hbst., *Crypticus gibbulus*, Quens., *Erodius tibialis*, L., two species of *Zophosis* and of *Stenosis*, *Tentyria maroccana*, Sol., and other interesting Heteromerous forms; while, especially towards evening, the truculent-looking *Scarites gigas*, L., is often to be seen prowling over the sand in search of prey, having quitted his burrow at the roots of a tuft of *Ononis*. Beyond the Spanish lines is the village of "San Felipe de la Linea," which straggles over a large extent of ground, and is, I may safely say, the most filthy and squalid place I have ever seen. There is, unfortunately, no way of reaching the open country except through this delightful village, and even when the pedestrian has run the gauntlet of its thousand and one evil odours, his troubles are not yet at an end. The path for the next mile or so is along the sandy beach of the Bay, which is, except under certain conditions of the tide, exceedingly fatiguing to traverse, being cut up by the hoofs of innumerable beasts of burden, chiefly of the humbler sort. Another path leads through Linea to the foot of the Sierra Carbonera, or as it is called in Gibraltar, the "Queen of Spain's Chair," but this also traverses a mile or more of clean, loose sea sand, drifted into hillocks by the wind, and entirely destitute of vegetation. The eastern (Mediterranean) beach is very dreary and barren, and the only noteworthy insect I have found here is *Nebria complanata*, L., not uncommonly under large pieces of wreck timber, in company with *Trachyscelis aphodioides*, Latr. On the western beach, such beetles as *Isocerus purpurascens*, Hbst., *Crypticus pruinosus*, Duf., *Helops pallidus*, Curtis, *Ammophthorus rugosus*, Rosh., two species of *Phaleria* and *Psammobius porcicollis*, Ill., may be found at almost any time at the roots of sea spurge, and the conspicuous black and white spotted larva of *Brithys pancratii*, Cyr., is common on the sea lily, *Pancratium maritimum*, eating the leaves down to the sand. This sandy beach extends to Algeçiras, a distance of 12 miles round the Bay, and is intersected by the mouths of two small rivers, the Guadarranque and the Palmones, as well as by some minor streams.

A fairly good road (for Spain) leads from the beach through the Village of Campamento to the small and clean town of San Roque, rather prettily situated on the top of a low hill about six miles from Gibraltar. Beyond this the country, hitherto bare and treeless, except for a few gardens and a grove of blue gum trees at Campamento, improves very much. Two large plantations of the stone pine (*Pinus cembra*) may be mentioned as especially good collecting ground, and in the early spring the country is one sheet of beautiful wild flowers, species of *Helianthemum* and *Cistus* predominating. Just beyond the "second Pine Wood," at about nine miles from the Rock, commences the "Cork Woods," the great hunting ground of the district, which extend for many miles along the valley of the Guadarranque and the adjoining hillsides. These woods are chiefly composed of the *Quercus suber* (cork oak) and *Q. lusitanica*, with a sprinkling of ash ; and, where the ground is marshy, with alder trees of unusual size, and a very varied undergrowth. Most of the cork trees have a very curious appearance from the bark being stripped off to a height of ten or twelve feet from the ground : a good deal of the timber is recklessly cut down to be converted into charcoal, but it is rare to find a log or stump in good condition for working at. This wood never failed on every visit (and I walked out there at least weekly throughout April, May, and June) to produce something new and interesting to me ; the furthest point reached on foot being the " Long Stables," 14 miles from the Rock, which is thus the limit of my collecting.

The local list of butterflies is not at present a large one, consisting of 55 species, including the specimen of *Danais Plexippus*, L.,* recorded in Ent. Mo. Mag., 1886, vol. xxiii, p. 162 : and of these, 30 species, indicated by an asterisk, have been observed by me on the Rock itself. Some 900 species of *Coleoptera* have as yet rewarded my efforts, but this Order is evidently far from exhausted here, as I never fail to find one or more additions in every walk in the country : the other Orders of insects, especially the *Hemiptera* and *Hymenoptera*, appear also to be very well represented.

At the time of my arrival here, on the 20th October, 1886, the aspect of the Rock presented a curious mixture of autumn and spring, some recent copious showers of rain having caused the fresh green grass to sprout up everywhere, with a good number of flowers in favourable spots, while, at the same time, the leaves of the plane and poplar trees were brown, withered, and falling. Insects were by no means numerous on the wing, as besides those butterflies already mentioned as existing all the year round, only odd specimens of *Papilio Machaon*,* *Satyrus Megæra*,* *Lycæna bœtica*, L.* and *Telicanus*, Hb.,* *Spilothyrus alceæ*, E.,* and *Macroglossa stellatarum*, were to be met with. A male *Chærocampa celerio* in very fine order was brought to me on November 12th, and a few *Noctuæ* were taken on ivy bloom, which, however, does not appear to be nearly as attractive as at home.

In *Coleoptera* a great deal more work was to be done, and, during the months of November and December, I obtained a large number of species : my usual hunting ground being the lower slopes of the Sierra Carbonera and the open country between these hills and Campamento, easily reached in little more than an hour's walking. As an instance of the abundance of beetle life here, I may mention that 100 species were not unfrequently taken in an afternoon's work (on one day I bottled 135 species), and from 30 to 40 were sometimes shaken out of a single tuft of grass. Turning stones was also very remunerative, three *Carabi* (*rugosus*, F., *melancholicus*, F., and another species) being of frequent occurrence, as well as *Scarites hespericus*, Dej., *Siagona Jenissoni*, Dej. (a most active creature), and *Aptinus displosor*, Duf.

When a stone, on being raised, revealed half a dozen or more of the latter insect, as often happened, the noise of the explosions of these large and powerful "Bombardiers" was quite startling, and the volatile liquid they discharged was strong enough to cause a distinct sensation of burning in my fingers, which were deeply stained brown for several days afterwards. At least five species of *Brachinus* were present, the little pallid *B. testaceus*, Ramb., and *sclopeta*, F., being the most noteworthy: with the latter *Drypta dentata*, Rossi, occurred very copiously in damp places. *Callistus lunatus*, F., and the beautiful *Lebia pubipennis*, Duf., were but seldom found, but the usually rare *Singilis bicolor*, Ramb., was quite plentiful, with two species of *Platytarsus*, and of *Cymindis*, *Licinus silphoides*, F. (variety), *Masoreus ægyptiacus*, Dej. (in sandy spots), *Chlænius chrysocephalus*, Rossi, and *azureus*, Dej. (rare), *Orthomus hispanica*, Dej., *Percus politus*, Dej., and the elegant *Feronia crenata*, Dej., among others. The large and fine *Ditomus cephalotes*, Dej., occurred rarely near San Roque; two species of *Aristus* were not unfrequent, with the active little *Apotomus rufus*, Rossi, under almost every big stone. Many interesting forms of *Pselaphidæ* and *Scydmænidæ* were to be seen, on close scrutiny, clinging to the under-sides of the stones with sundry *Staphylinidæ*, the rare and curious *Ctenomastax Kiesenwetteri*, Ktz., among them; as well as two species of the singular genus *Cossyphus* (*Dejeani*, Brême, and *incostatus*, Lap.), *Calcar elongatum*, Hbst., *Adelostoma sulcatum*, Dup., the queer little linear *Boromorphus tagenoides*, Luc., *Litoborus planicollis*, Waltl, and two species each of *Stenosis* and *Dichillus*. All these latter were to be found in the tufts of grass, with a host of other small beetles, chiefly *Rhynchophora*: among these may be mentioned *Leucohimatium elongatum*, Er., *Dermestes sardöus*, Kust., *Melyris granulata*, F. (abundant), two species each of *Sphenoptera*, *Aphanistichus*, *Trachys*, and *Throscus*, some eight or ten *Anthici*, *Scleron armatum*, Waltl (in plenty), various species of *Ptinus*, *Acalles*, *Gymnetron*, *Pachytychius*, *Baris*, *Rhytirhinus*, &c., with occasional examples of *Cleonus excoriatus*, Gyll., *Rhytideres plicatus*, Ol., the gaudy black and scarlet *Lithonoma limbata*, F., *Platynaspis villosa*, Fourc., and a *Thorictus*. Three or four brilliant green and coppery-red *Chrysomelæ* abounded on the wild mint, and the beautiful *C. americana*, L., was to be found in plenty on *Lavandula stæchas*. Walking about in the roads *Brachycerus undatus*, F., and a smaller species were not rarely seen, and the *Coprophaga* were represented, in their usual habitats, by the big black *Copris hispana*, L., *Geotrupes Hofmannseggii*, Frm., *momus*, Oliv., and *hypocrita*, Serv., *Bubas bison*, L., *Onthophagus taurus*, L., and others of the last genus, all common.

In and about small pools of water were found various *Dyschirii* and *Bledii*, *Georyssus*, sp., *Parnus hydrobates*, Kies., and a fair number of the smaller *Hydradephaga*. Among the wood-feeders the tiny *Hypoborus ficus*, Er., abounded in the small twigs of fig trees, burrowing under the bark, and an old mulberry stump at Linea was full of *Liparthrum mori*, Aubé. Hibernating under the loose flakes of bark on *Eucalyptus* trees at Campamento, were swarms of common beetles; among them the pretty little *Cardiophorus* 6-*punctatus*, Latr., in clusters of a dozen or more. Small puff balls yielded a good supply of *Lycoperdina bovistæ*, F.

My most interesting captures were, however, made in the nests of the large black ants (*Atta capitata*, and *barbara*,), which abounded under stones. With these ants I was fortunate enough to find the rare and singular little Myrmecophilous

Carabid, *Pseudotrechus mutilatus*, Rosh., in company with the equally curious *Oöchrotus unicolor*, Luc., *Merophysia carinulata*, Rosh., *Colnocera attæ*, Ktz., and *Dinarda nigrita*, Rosh. The still more wonderful *Paussus Favieri*, Fairm., was found in the nests of a smaller brown ant (*Pheidole pallidula*), but this insect and the *Pseudotrechus* were met with more frequently in February and March.

Early in January I left for England, and returned to Gibraltar on February 15th. The weather was then cool and showery, with warm sunny days at intervals, and I found that vegetation had made much progress during my absence, and a few of the early butterflies began to put in an appearance. Thus, on the 17th, *Papilio Machaon*, *Euchloë Belemia*, E.,* and hibernated *Gonepteryx Cleopatra*, L.,* were on the wing, reinforced at the end of the month by *Lycæna Icarus*, Rott.,* *Astrarche*, Berg.,* and *Thais rumina*, L.* The latter beautiful insect abounded both on the Rock and in the Cork Woods, frequenting open bushy spots where its food-plant, *Aristolochia glauca*, Desf., grew in plenty, and it could be caught without much difficulty. *Euchloë Belemia*, on the other hand, usually cost a hard run before it was secured, being (as might be judged from its robust build) as swift and strong on the wing as *Colias Edusa*. *Thestor Ballus*, Hb.,* appeared on March 9th, and *Euchloë euphenoides*, Stgr.,* on the 11th, but the weather in March was not favourable for collecting, and it was not until the 26th that I was able to make my first excursion of the year to the Cork Woods. On this day, which was warm and sunny, the profusion of insect life was very remarkable, and I noticed no fewer than 25 species of butterflies on the wing. *Leucophasia sinapis*, L., was common, *Pieris Daplidice*, L.* (very pale), was not rare, and *Euchloë euphenoides*, flitting quietly from flower to flower, made quite a feature in the scene: with it were a few *E. Belia*, var. *Ausonia*, Hb., and one or two of what I take to be *E. tagis*, Hb., but am not quite sure. *Thecla rubi*, L., although common, was getting worn, and I noticed one or two of an early brood of *Lycæna Telicanus*, Hb., besides nearly all the other species of butterflies as yet mentioned. *Chelonia villica*, L., occurred singly, and worn males of *Saturnia carpini*, S. V., were rushing about in all directions in the Cork Woods. Among the *Coleoptera* were *Cicindela campestris*, var. *maroccana*, F., and *flexuosa*, F., *Melolontha papposa*, Ill., flying by hundreds near the ground in shady places, a fine black *Bolboceras*, and the curious *Sepidium bidentatum*, Sol., previously found by me in abundance at Malaga in 1876. Towards the end of the month I met with the singular little flat yellowish weevil, *Derelomus chamæropis*, F., plentifully in the male flowers of *Chamærops humilis* on the Rock.

The chief entomological feature of April was the abundance of the large *Ateuchi* (*sacer*, L., *variolosus*, F., and more rarely *semipunctatus*, F.), which were to be seen everywhere on the wing, or else, in pairs, busily providing for the future by rolling up and burying balls of stercoraceous matter much larger than themselves. The queer long-legged *Sisyphus Schafferi*, L., appears to be quite rare here, but *Gymnopleuri* of two species, and *Oniticellus*, abounded on their food, with the large black *Onitis Olivieri*, Ill. Conspicuous everywhere in the open ground was the huge red-striped *Meloë maialis*, L., and in the Cork Woods, *Endophlæus*, *Cerylon*, *Colydium*, *Plegaderus*, *Platysoma*, *Liodes*, *Hypophlæus*, and *Platypus*, were more or less copiously represented under bark. Here, too, I had the good fortune to find the remarkable Brenthid weevil, *Amorphocephalus coronatus*, Germ., in an old cork tree much infested with a large species of ant somewhat resembling *Formica rufa*: about a week afterwards, near Algeçiras, I met with another specimen, all but perfect and in very good condition, in a pellet of beetle remains thrown up by a nightjar, which had evidently found the weevil a somewhat indigestible morsel. The handsome *Asida holosericea*, Germ., was occasionally to be found running on the paths on the Rock and near San Roque.

On April 19th we had the last heavy rainfall of the season, no less than 6¾ inches coming down in 24 hours. A vast quantity of flood refuse was brought down into the Bay by the swollen streams, and the wind and tide drove it across to the Dockyard, which, in consequence, teemed with insect life for several days. Among a host of other species I found the fine *Siagona Dejeani*, Ramb., and *Pheropsophus hispanicus*, Dej., for which I had previously searched in vain; also *Siagona europæa*, Dej., *Scybalicus oblongiusculus*, Dej., *Polystichus vittatus*, Brull., *Drypta distincta*, Rossi, *Acinopus megacephalus*, Rossi, *Calosoma indagator*, F., *Anisodactylus heros*, F., and *Scarites lævigatus*, F. After this the weather became settled for the summer, and numerous flower-hunting beetles, chiefly species of *Clythra*, *Anthrenus*, *Œdemera*, *Meligethes*, *Hoplia* (a bright yellow species, common), and *Dasytes* and other small *Malacodermata*, began to appear. Among the *Lepidoptera* were some very fine large ♂ specimens of *Euchloë cardamines*, L., in the Cork Woods on April 8th, where *Pyrgus Sao*, Hb., appeared on the 16th, but the first brood of this species was scarce and local; on the 22nd the pretty *Epinephile Pasiphaë*, E.,* was first observed, and was numerous a week later on grassy, bushy slopes. The var. *Glauce*, Hb.,* of *Euchloë Belemia* was on the wing by the 23rd, and *Melitæa Phœbe*, Kn., and *Lycæna melanops*, Bdv., were found in abundance and superb condition on the 30th, in a heathy part of the Cork Woods. On the same day I took *Lycæna bellargus*, Rott. (2 ♂), *Cerocala scapulosa*, Bdv., and the pretty pink Geometer, *Pellonia vibicaria*, Clerck.

May produced more than a dozen additional butterflies to my local list, viz.: *Epinephile Janira*, var. *Hispulla*, Hb.* (7th), and *E. Ida*, E.* (12th), *Pamphila Thaumas*, Hufn., and *Actæon*, E. (12th), *Pyrgus Proto*, E.* (14th), *Thecla spini*, Schiff.* (14th), and *T. ilicis*, E. (21st). These were all more or less abundant except *T. spini*, which was confined to a small space in the Cork Woods, where, on the 21st, I obtained a beautiful specimen of *Melanargia Thetis*, Hb. (*Ines*, Hfsgg.), the only one which I saw. A week later (28th), *Gonepteryx Cleopatra* was on the wing in the most lovely condition, and I saw a magnificent *Argynnis Pandora*, Schiff., in the Cork Woods, which, however, I could not capture. A visit to Algeçiras on the 16th produced *Spilothyrus althææ*, Hb., and the beautiful blue variety *Lorquinii*, H.-S., of *Lycæna minima*, Fuess. *Cænonympha Pamphilus*, L.,* was also taken on the Rock during May, but appears to be rare here, as I heard of but two specimens. The beautiful *Zygæna lavandulæ*, Es., was seen in plenty near San Roque on the 7th, but could not be found a week later; at the end of the month, *Z. bætica*, R., occurred abundantly on a species of *Cytisus*, both in the larval and perfect states, and a second smaller brood occurred in September. *Deiopeia pulchella*, L., always common, was so numerous in the middle of the month as to be a nuisance, and the larvæ of *Saturnia carpini* and *Ophiodes lunaris*, W. V., were to be seen all over the Cork Woods. The beautiful larva of *Spintherops spectrum*, F., abounded on the white broom, *Retama monosperma*, near Linea. Among the *Coleoptera*, two fine species of *Cetonia* and four of *Larinus* frequented the flowers of the wild artichoke *(Cynara cardunculus)*, in company with two species of *Agapanthia*, and a fine beetle related to *Clerus*. *Trichodes sipylus*, L. (abundant), and *octopunctatus*, F. (rare), with sundry species of *Acmæodera*, *Clytus*, *Mordella*, and *Cryptocephalus*, were found on umbels, while *Omophlus ruficollis*, F., *Cardiophorus sexpunctatus*, Latr., and *Hymenoplia strigosa*, Ill., were to be seen on almost every flower. A large and handsome *Julodis (fidelissima*, Mars., I think) was occasionally taken on the wing, but, on the whole, the *Buprestidæ*, and especially the *Longicornes*, were very much scarcer than I had expected to find them.

In June, my first noteworthy capture was the beautiful little *Aurotis roboris*, E., flying about an oak tree in the Cork Woods on the 4th, but it appeared to be rare, and I got only one more, on the 9th. *Vanessa polychloros*, L., and *Gonepteryx rhamni*, L. (of both of which I had seen hibernated examples in the spring), were also taken on the 9th, and two pretty "Burnets," *Zygæna stæchadis*, Bork., and *Sarpedon*, Hübn., were found, but were scarce and local. *Catocala paranympha*, L., was not scarce on the cork trunks, and the little chestnut-brown *Anthometra plumularia*, Bdv., was often seen flying over broom bushes. Two "clear-wings," *Sesia Ramburi*, Staud., and *Paranthrene tineiformis*, E., occurred on the flowers of wild carrot and thyme, which were also frequented by *Acontia luctuosa*, W. V., and *Acidalia ornata*, Scop. On the 18th I took, at Campamento, the only specimen *of Argynnis Latona*, E., which I have seen in the district, and, on the same day, *Colias Edusa*, var. *Helice*, Hb., was common and fine, among myriads of the ordinary form. On the 20th I saw for the first time on the Rock the conspicuous *Satyrus Fidia*, L.,* and a week later it was common. It is a very imposing looking butterfly on the wing, but flies strongly, and has a *penchant* for the roughest and most tangled spots, occasionally settling on rocks or walls, but is very shy and difficult to approach, being more easily taken in the afternoon, when it comes down to the newly watered roads. I took *Thecla spini* on the Rock on the 22nd, and, on the 26th, *Cœnonympha Dorus*, E., was met with near San Roque. Second broods of *Leucophasia sinapis*, *Pyrgus Proto and Sao*, occurred this month, the last being much more common and widely distributed than the first brood had been. *Coleoptera*, although still very numerous in individuals, fell off greatly in number of species towards the end of the month, my chief additional captures being the bulky *Polyphylla fullo*, L., on the Rock, *Lagria lata*, F., *Trichius abdominalis*, Ménétr., and three species of *Cebrio*, unfortunately all singly; *Calosoma sycophanta*, L., was also taken near Algeçiras. A large *Myrmeleon* with spotted wings was common and very conspicuous.

In July, *Cœnonympha Dorus* was plentiful in its locality near San Roque during the first half of the month, and *Hipparchia statilinus*, L., made its appearance on the 2nd, being very common on the 9th, when another brood of *Lycæna bellargus* was out, but was very scarce. *L. argiolus*, L.,* which I had occasionally seen in February and March, was now not uncommon on the Rock, and *Abraxas pantaria*, L., swarmed about the ash trees in the Alameda, which were completely stripped by its larvæ. On the 13th I met with *Pyrgus fritillum*, Hb. *(v. alveus*, Hb.), by the roadside between Campamento and San Roque, but it was very local, and, on the same day, took a pair of *Thecla quercus* flying about an oak tree. The dark form (*eleus*, F.) of *Chrysophanus Phlæas* abounded during the month, and, on the 29th, *Pamphila nostradamus*, F.,* was added to my local list, and was common throughout August, being constantly found at the flowers of a heliotrope bush in the Alameda in company with *Lycæna Telicanus*. *Sciapteron tabaniforme*, Rott., also occurred on the Rock.

August was a comparatively unproductive month, the butterflies being now reduced to some dozen species, mostly worn, though I added one species to my local list, *Lycæna Lysimon*, Hb., found sparingly in a waste place near Campamento on the 17th. *Lycæna bœtica* was very plentiful, much more so than I had ever seen it before, and a few good moths were taken, such as *Raphia hybris*, Hb., and *Cerura bifida*, var. *urocera*, Bdv., on poplar trunks, and *Megasoma repandum*, Hb., in the larva state near the mouth of the Palmones River, where *Ocneria dispar*, L., had evidently been abundant earlier in the season, judging from the number of its egg patches on the oak trunks. My chief captures this month were among the *Hydradephaga*, as in a small deep pool in the bed of a winter stream near Campamento, I obtained *Dytiscus circumflexus*, F., *Cybister Roeselii*, F., and another *Cybister* with entirely pitchy-black under-side (I think *C. tripunctatus*, Ol.), all three in large numbers, with *Eunectes sticticus*, L., *Pelobius tardus*, Hbst., *Hyphydrus variegatus*, Aubé, *Noterus lævis*, Sturm, and many small species of *Hydroporus*. I took *Chærocampa celerio*, L., in the town on the 7th, but this is evidently not a good year for hawk-moths. I heard of only one *Sphinx convolvuli*, and saw only one or two larvæ of *Deilephila euphorbiæ*, L.; of *D. livornica*, unusually common here, I did not meet with a single specimen, and *Acherontia Atropos*, L., was represented by a single larva feeding on the thorny *Solanum sodomæum*, Willd. On the whole, September was decidedly unproductive, and, as the rains have been very late this year, October was but little better, though *Coleoptera* were becoming more numerous towards the end of the month. At the ivy blossom in the Alameda, I am now taking such moths as *Leucania extranea*, Gu., *Agrotis saucia*, Hb., and *puta*, Hb., *Laphygma exigua*, Hb , *Polia canescens*, Dup., *Hadena Solieri*, Bdv., *Calocampa vetusta*, Hb., *Margarodes unionalis*, Hb., &c., but all sparingly.

It will be seen that no very great number of species of night-flying moths have been met with by me, but this is probably due to the fact that collecting on the Rock after dark is by no means easy, owing to military restrictions, and is quite out of the question in the adjoining country. The gates of the fortress are closed for the night half an hour after sunset, and should the Entomologist unfortunately find himself the wrong side of the barrier, he would be compelled to put up with such accommodation as is to be got in the "fondas" of Linea, whose insect denizens would no doubt exact ample vengeance for the slaughter of their fellow creatures during the day.

H. M. S. "Grappler," Gibraltar:
October 31*st*, 1887.

There are notes on the *Coleoptera* of Gibraltar in an old paper (which we have not seen) published in the "Isis" for 1818, by Johann Natterer. In the "Reise der Novara" there are sundry allusions to insects of various Orders observed at Gibraltar. There may be others, but nothing of a faunistic nature has been published.—Eds.

Terias Bethesba and læta.—I am now able to bring positive proof of the identity of these two supposed species much sooner than I had hoped for. I yesterday received a letter from Mr. Nawa, dated Gifu, 26th September, to say that he had bred a number of *Terias læta*, which were seven days in the pupa state, but no *Bethesba*, from the larvæ he supposed to be from eggs laid by *Bethesba*. Mr. Nawa adds, that notwithstanding this, he cannot believe *læta* and *Bethesba* are the same species, but thinks the ova he obtained from female *Bethesba* all perished, and the larvæ of *læta* were unnoticed on the plants he gathered, and placed in his breeding cage. This is precisely the same idea I entertained when I first bred *Hecabe* from *mandarina*, and would certainly be probable, but for the fact that we both, working independently, 200 miles apart, obtained exactly similar results, and that I am quite certain, for my part, that neither eggs nor larvæ were accidentally introduced into *my* breeding cage. Mr. Nawa also points out that I am in error in stating, in the "Rhopalocera Nihonica," that *læta* appears from March to November. I think the mistake is easily explained, as I find, on reference to my diaries, that *læta* is last seen in the year in November, and again first in the year in March. At the time I wrote the note in the Rhop. Nihonica I had no idea of the important signification of this fact, and I think no one would, from its appearance, entertain a doubt but that *læta*, more so even than any other *Terias*, was a perfectly distinct species.

I am, however, now perfectly convinced that *Terias læta* and *Bethesba* are forms of the same species, and therefore propose uniting them under the name of *Terias biformis*. I enclose an outline sketch of the wings of both forms.

The most important question, however, is still unsolved. We have no clue to the reason why the hibernating form should be large with pointed wings, and the summer form small with rounded wings; the former, which is for a long period in the perfect state, is not in any way, as far as I can see, protected by this change of form; it is naturally a very conspicuous object, whether on the wing or at rest, and both forms have a feeble, slow flight.—H. PRYER, Yokohama: *October* 1*st*, 1887.

[The rule in cases where two supposed species are found to be only forms of one is, that the earlier existing name be adopted, not a new one coined. It seems to us a salutary rule.—EDS.]

Parnassius Delius in Wales.—I am not surprised at such cases as *P. Delius* occurring in Wales. When I was last in Switzerland every one, to my wrath and disgust, seemed to be sending flowers by the post, until even the Riffel looked almost bare! Now *Saxifraga aizoides* is lovely and common, and doubtless many plants with plenty of eggs of *Delius* were sent to England. In Wales, where *Saxifrages* are common, one or two eggs might reach maturity.—R. C. R. JORDAN, 105, Harborne Road, Edgbaston, Birmingham: *November* 12*th*, 1887.

Setina irrorella on Ramsey Island.—I have long promised to send you an account of the taking of *S. irrorella* on Ramsey. I will now give you the particulars. The Rev. Murray Mathew had seen it there a few years before, and we were glad to have an opportunity for taking it. It was on the occasion of our Field Club meeting at St. David's. The weather had been bright and warm up to the time of our arrival there on the evening of June 10th, so we expected to find it out in full force on the morrow, the beginning of this month being the time it was due. In the morning, however, all was changed. A thick damp fog spread over land and sea, and it looked like anything but a fit day for the pursuit of Entomology. We started, however, soon after 10 for the shore, but when we got there we could not see the Island, though its distance was scarcely more than half a mile. A boat was waiting on the shore to take us across, and before we had rowed over the short channel which separated us from the Island the sun began to peep out, and by 12 o'clock the fog was quite dispersed. On landing, we passed over the headland which guards the south-eastern corner of the Island, and came upon a most lovely view of a bay studded with islands and rocks of all shapes, around which the sea birds were wheeling in vast numbers, filling the air with their plaintive cry. It was here, on the very edge of the cliff, that we found *S. irrorella* amongst the lichen-covered stones. Scarcely any of them were on wing; and it was not so very easy to see them, as the stones were covered with a bright orange lichen, which harmonized very nearly with the colour of the insect. On close inspection, however, they were found in considerable quantities, and in excellent condition; and from their sluggish habits were easily captured. We soon boxed more than 50 of them, and were satisfied, though we continued to meet with them along the west side of the Island also. No doubt it was on this orange coloured lichen that the larvæ were fed.—CLENNELL WILKINSON, Castlemartin, Pembroke: *November 23rd*, 1887.

Food of the larva of Aphomia sociella, L.—In January, 1884, I was peeling off the bark of an old willow, which stands in the middle of a swamp, hoping to find the cocoons of *Dicranura furcula*. Behind a large piece of loose bark I came upon a number of very tough silken galleries coated with the brown decayed fibre of the bark, and containing some good-sized whitish larvæ. I took home a batch of about a dozen of these galleries spun close side by side. Shortly afterwards I found another batch of similar galleries in my workshop, under a board lying among a lot of old sawdust. From both these batches of larvæ *Aphomia sociella* emerged. This was rather a puzzle, as supposing the larvæ to have gone to these places to hibernate, where could bumble bees find a place in which to form a nest, in the one case in a swamp, in the other in a stone-flagged yard? This year the Rev. H. Williams, of Croxton, informed me that he had found a wasp's nest infested with these larvæ, which fed on the *papery walls* of the nest, and not in the cells. Is it not possible that the true food of this larva is the woody fibre, whether of decayed bark, or of the nests of various Aculeate *Hymenoptera*? I may add that Mrs. Hutchinson, of Grantsfield, to whom I wrote for information concerning the habits of this species, has, in reply, kindly forwarded me two larvæ spun up under old bark exactly in the same way as those I found on the willow; there the species swarms about old furze bushes which would supply abundance of decayed fibre. Perhaps some one of your numerous readers may be able further to clear up the life-history of this species.—C. R. DIGBY, Studland Rectory: *November 15th*, 1887.

On the supposed Nepticula tormentillella.—I have this year bred several specimens of a *Nepticula* feeding in *Potentilla tormentilla* on the moors of Westmoreland. These do not agree with the description of *Nep. tormentillella*, but are identical with the one bred many years ago by Mr. Stainton from larvæ found near Dunkeld. The late Mr. Sang bred some specimens of a *Nepticula* from the same plant, and these Dr. Mason now possesses, along with a pair of mine. It would be interesting to hear whether these last also are identical. In any case, the new insect wants a name, and I would suggest that Mr. Stainton having first bred it, should act as godfather. I have now pupæ alive, as has also Mr. Warren, to whom I sent larvæ this autumn.—I. H. THRELFALL, Ashton, Preston : *December 5th*, 1887.

Bohemannia quadrimaculella in Norfolk.—When at Lowestoft last August, I found *Bohemannia quadrimaculella* flying in the sun, and, as usual, amongst alders. Can anybody suggest its mode of life ? I should fancy that it ought to be possible for some one living in a neighbourhood where it occurs to breed it, by fixing a shoot of alder, *with seeds*, in a glass tube with muslin over the ends, and then turning a few of each sex into the cage thus formed. I have found this plan succeed with the oak-feeding *Tinagma sericiellum.*—W. C. BOYD, College Road, Cheshunt : *December 13th*, 1887.

Review.

THE LIFE AND LETTERS OF CHARLES DARWIN : Edited by his Son, FRANCIS DARWIN. 3 vols. London : John Murray. 1887.

To all who take an interest in the progress of science, there are few more interesting biographies than the present ; for Charles Darwin had gained the devotion of those who admired his scientific work, as well as of those who had known him personally.

Born at Shrewsbury in 1809, his taste for collecting was "well developed" when about eight years old. At school his education under the classical system "was simply a blank" (vol. i, p. 32). Once Dr. Butler (the master) "publicly rebuked" him for working at Chemistry, "and thus wasting my time on such useless subjects" (vol i, p. 35). Later he was too fond of his gun and "the stubbles," so that his father (a physician, and son of the author of "Zoonomia") once said to him, "you will be a disgrace to yourself and all your family." In 1825 he went to Edinburgh to study medicine, but, having no taste for anatomy he made no dissections, which "has proved one of the greatest evils of my life." In 1828 he was sent to Cambridge, with the view of becoming a clergyman ; there he "got into a sporting set," but was rescued by the Rev. Prof. Henslow, and from him he received the impetus which determined his future career. At this time he was an eager collector of beetles. Writing to Sir J. Lubbock years after, he says, "I feel like an old war horse at the sound of the trumpet, when I read about the capture of rare beetles." Collecting he thought "the best sport in the world" (vol. iii, p. 114).

On the 27th of December, 1831, he sailed in the Beagle (a ten gun brig, a class of ships in those days sometimes called "coffins") from Devonport, on the celebrated voyage which occupied five years. During this time he collected largely ; but for entomologists it will always be a matter of regret that only a few fragmentary notices of the insects were published. From their novelty, as well as from a geographical point of view, they were very interesting. Soon after his return he was led to think, from "the principle of selection by man," that there was "an unerring power at work in *Natural Selection*," acting "exclusively for the good of each organic being;" in this way he asks, "what millions on millions of generations might not effect."

The phrase "Natural Selection" is generally taken as synonymous with "Survival of the Fittest," but Wallace has clearly shown that whilst the former is a cause, the latter is an effect. Darwin himself was eventually dissatisfied with it, and would have preferred "Natural Preservation," but it was too late, the phrase was in every one's mouth. Several scientific men, indeed, thought the "term good, because its meaning is not obvious," and the Duke of Argyll stamps it as "a phrase rich in ambiguities" (Nineteenth Century, April, 1887).

For more than twenty years Darwin was occupied with "The Origin of Species," which he thought would be forgotten in ten years. During that time, however, he produced his "Monograph of the Family *Cirripedia*" in two volumes (Ray Society, 1851 and 1853), a work which showed his rare talent for investigation.* Whilst doubting whether it was worth so much time (eight years), he "recognised" that he had become a "trained naturalist after, and only after, the *Cirripede* work." Prof. Huxley thought "he had never done a wiser thing" than devoting himself to those "years of patient toil."

It was in 1858 that Darwin and Wallace's papers were read at the Linnean Society (July 1st). Few remarks were then made, the Fellows present thinking probably, like Sir C. Lyell, that the theory was merely a "modification of Lamarck's doctrine of development and progression" (vol. iii, pp. 14 and 16), to which attention had previously been called in the well-known "Vestiges" (1845), a work which, whatever may be said, gave a great blow to the idea of the fixity of species.

The "great work of his life" (The Origin of Species) was published in 1859, and at once created a furious storm of disapprobation. "No word in the English language," wrote one clergyman, "is sufficient to express my contempt for Darwin and the Darwinians." Friends like Prof. Sedgwick and Dr. Whewell were almost as bitter; the latter for many years would not allow a copy to be placed in Trinity College Library.

It is in his letters which fill the greater part of the three volumes that we see the inner life of the man. For more than forty years he suffered from the effects of his voyage, and expressions of the pain and discomfort, from what he calls his accursed stomach, are constantly occurring. For one who for so long a time never enjoyed a day's ordinary good health, to have accomplished so much, is a remarkable instance of intellectual energy.

The letters are principally answers to Sir C. Lyell, Sir J. D. Hooker, Prof. Huxley, Mr. Wallace, and others, who questioned some of his conclusions. Huxley thought he had "loaded himself with an unnecessary difficulty" in adopting the dogma of *Natura non facit saltum*; and again in considering "continued physical conditions of little moment," why "variation should occur at all." This difficulty had "greatly troubled" Darwin, he says, "if, as I must think, external conditions produce little *direct* effect—what determines each particular variation; what makes a tuft of feathers come on a cock's head; or moss on a moss rose?" (vol. ii, p. 233). In the same strain "we may ask in vain why one mouse has longer ears than another mouse, and one plant more pointed leaves than another plant?" (vol. iii, p. 25). In the Quarterly Review (April, 1869), Mr. Wallace wrote, "we must therefore admit the possibility that in the development of the human race, a higher intelligence (than man's) has guided the same laws for nobler ends." From this Darwin differed "grievously" (vol. iii, p. 116); further on he says, "I fear we shall never quite understand each other." Of Hooker's Introduction to the New Zealand Flora he complains that "parts take the wind completely out of my sails" * * * "I shall gnash my teeth and abuse you for having put so many hostile parts so confoundedly well." Elsewhere he thanks Hooker "for the dose of soft solder;" he tells Lyell, referring to his hesitation as to the immutability of species, "you cut my throat and your own throat" (vol. ii, p. 341), and he felt aggrieved that Herbert Spencer should be his "superior in the master art of wriggling."

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* See also "Observations on the Structure and Propagation of *Sagitta*," Ann. and Mag., vol. xii, p. 18, *seq.* (1841).

Of Mr. Mivart's "Genesis of Species' (1871) he finds the "book is producing a great effect against 'Natural Selection,' and more especially against me" * * * "I feel very doubtful how far I shall succeed in answering him" (vol. iii, p. 144 & 146). In the 6th edition of the "Origin," Darwin devoted a chapter to these objections, the more serious of which was the absence of "the infinitely numerous fine transitional forms" "of the countless generations of countless species which have certainly existed" (Orig., p. 408).

In a letter to Karl Semper there is the following statement: "As our knowledge advances, very slight differences, considered by systematists as of no importance in structure, are continually found to be functionally important" (vol. iii, p. 161). Here many will wish that Darwin had followed Lyell's advice in a letter dated October 3rd, 1859, that he should in a future edition "here and there insert an actual case to relieve the vast number of abstract propositions" (vol. ii, p. 206).

"One of his greatest services to the study of Natural History is," says his biographer, "the revival of Teleology" (vol. iii, p. 255); yet, in regard to chance and design, Darwin writes, "again I say I am, and shall ever remain, in a hopeless muddle" (vol. ii, p. 354). See also vol. i, p. 313.

Of Darwin's extreme candour, modesty, and love of truth, there is ample evidence. As to the latter, Mr. Romanes relates that once, at one o'clock in the morning, when sitting in a room at Down with one of the sons, Mr. Darwin appeared at the door in dressing gown and slippers, to correct a remark made the previous evening, that he "was most affected by the emotions of the sublime when he stood upon one of the summits of the Cordillera (*sic*) and surveyed the magnificent prospect around," now he was sure that he "felt it even more in the forests of Brazil" (vol. iii, p. 55).

Mr. Darwin was an avowed Agnostic, not an Atheist. He did not believe in revelation (vol. i, p. 308); he had come to see that the Old Testament was "no more to be trusted than the sacred books of the Hindoos." But no man led a purer and, but for his constant ill-health, a happier life. "His Natural History studies had been the solace of what might have been a painful existence." At the last he said, "I am not in the least afraid to die." If he had a fault it was perhaps that he had, according to Wallace, "the restless curiosity of the child to know the 'what for?' the 'why?' and the 'how?' of everything." This tendency sometimes led him into speculations beyond his calmer views, that were omitted or modified in subsequent editions of the "Origin."—F. P. P.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY. —The Annual Exhibition was held at the "Bridge House," London Bridge, on Wednesday, the 16th November, 1887, and, notwithstanding the dense fog that prevailed, was attended by about 1000 visitors.

The exhibits comprised all branches of Natural History, and during the evening the Sciopticon Company gave two displays of micro-photographs. Among the principal Entomological exhibits were those of Mr. McLachlan, European *Trichoptera*, &c.; Mr. S. L. Mosley, life-history of the Hessian fly, *Cecidomyia destructor*, &c.; Mr. Eland Shaw, *Orthoptera*; Mr. F. Grut and Mr. Epps, Exotic *Coleoptera*; Mr. Lewcock, British *Donaciæ* and *Longicornia*; Mr. Billups, British *Coleoptera*, *Hymenoptera*, *Diptera*, &c.; Mr. Bignell, a case of galls and gall-flies; Mr. J. H. A. Jenner, Mr. C. H. Morris, and Mr. Cripps, British *Coleoptera*. In the Order *Lepidoptera* the exhibits were very numerous. Messrs. C. A. Briggs, A. B. Farn, T. W. Hall, E. Sabine, R. South, S. Webb, British *Lycænæ*; Mr. A. H. Jones, European *Lycænæ*; Messrs. J. Jenner Weir, S. Edwards, Frohawk, Dannatt, E. Cooke, and the Zoological Society of London, Exotic species; Mr. Elisha, collection of *Tortrices*, *Tineæ*, and *Pterophori*; Mr. Adkin, *Ephestia Kühniella*, with flour affected by the larvæ, &c.; Mr. J. A. Clark, varieties of *Z. pyrina*, &c.; Mr. S. Stevens, varieties of British *Rhopalocera*, specimen of *Melitæa Eos*, taken in 1802; Mr. Machin, *Peronea hastiana* and *cristana*; Mr. C. H. Morris, *Acidalia immorata*; Mr. Boden, varieties, including one of *Ennychia octomaculata*, and a species which was not identified; Mr. Howard Vaughan, *Cidaria truncata* and *C. immanata*; Mr. G. Baker, larvæ and imagos of *Eupithecia nanata* and *E. Curzoni*; Mr. Tugwell, collection of *Noctuæ*; Mr. Tutt, *Agrotidæ* and *Zygænidæ*; Mr. Wellman, species of *Eupithecia* and *Pterophoridæ*, &c.; Mr. Eedle, life-histories. Among the other exhibitors in this Order were Messrs. Hutchinson (Leominster), R. E. Salwey, Blackall, Druce, Goldthwaite, Percy Russ (Sligo), &c. Messrs. Neighbour and Sons exhibited bees and bee-keeping appliances, and there was a good display of microscopic objects, the Society being assisted by Members of the Quekett, South London, and Hackney Microscopical Societies.

November 24th, 1887.—R. ADKIN, Esq., F.E.S., President, in the Chair.

Messrs. J. Reindorp and W. H. Whiffen were elected Members.

Mr. Adye exhibited *Sphinx convolvuli*, L., *Catocala promissa*, Esp., *C. sponsa*, L., *Xylina ornithopus*, Rott., *X. semibrunnea*, Haw., and *X. socia*, Rott., all from the New Forest; Mr. Mera, species taken on Wansted Flats; Mr. C. A. Briggs, a fine variety of *Arctia caia*, L.; Mr. Billups, a cocoon of a South American moth, from which over 140 of a parasite of the genus *Smicra* had emerged; Mr. Billups also exhibited, on behalf of Mr. Mosley, a case illustrating the life-history of the Hessian Fly, with examples of infested straw; and, on behalf of Mr. Bignell, a case of British galls, with gall flies, and contributed notes; Mr. Fenn, on behalf of Mr. T. D. A. Cockerell, caddis-cases, *Helicopsyche*, sp. ?, a genus of *Trichoptera* from Divide Creek, Garfield County, Colorado, which very closely resemble the shells of the genus *Valvata*; Mr. R. Adkin exhibited series of *Spilosoma mendica*, Clerck, including males varying in colour from creamy-white to smoky-brown, and females of the usual white form, bred from ova from Co. Cork, &c.: he remarked that the light coloured males were the var. *rustica*, Hüb., that it had been taken both in the north and extreme south of Ireland, but that he had no definite record of it from the central or western districts; Mr. West (of Streatham) exhibited specimens of *Locustidæ* from Switzerland.

December 8th, 1887.—The President in the Chair.

Messrs. W. White, F.E.S., A. J. Hodges, J. H. Leech, F.L.S., F.Z.S., G. H. Verrall, F.E.S., F. Grut, F.L.S., F.E.S., F. J. Winkley, A. Waterhouse, H. A. Yardley, and G. B. Routlidge, were elected Members.

Mr. Sheldon exhibited examples of the spring and summer broods of *Scoparia angustea*, St., and called attention to the larger size of the summer brood; Mr. Ince, a comparative series of *Nepa cinerea*, L., and remarked on the colour of the abdomen, ranging from red in some specimens to black in others; Mr. Tutt, examples of *Micro-Lepidoptera*, showing system of setting specimens unpinned, as advocated by Mr. G. Coverdale some time ago. Mr. Fenn read notes received from Mr. T. D. A. Cockerell on a case of mimicry between *Vanessa Antiopa*, L., and a species of *Locustidæ* in Colorado.—H. W. BARKER, *Hon. Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON: *Dec. 7th*, 1887.—Dr. DAVID SHARP, F.Z.S., President, in the Chair.

Mr. C. E. Stanley-Phillips, of Shooter's Hill; Mr. H. W. Barker, of Peckham; and Herr E. G. Honrath, of Berlin, were elected Fellows.

Mr. Jenner Weir exhibited, and made remarks on, twelve specimens of *Cicadetta hæmatodes*, collected last summer in the New Forest by Mr. Charles Gulliver. Only one of the specimens was a male, from which it was inferred that the males were more active than the females, and quickly retreated when disturbed.

Mr. McLachlan exhibited a specimen of *Pterostichus madidus*, F., which he had recently found in a potato. It seemed questionable whether the beetle had been bred in the cavity or had entered it for predaceous purposes. Mr. Theodore Wood, Mr. Kirby, and Mr. Herbert Cox took part in the discussion which ensued. Mr. McLachlan also exhibited two specimens of a species of *Trichoptera*—*Neuronia clathrata*, Kol.—which occurred rarely in Burnt Wood, Staffordshire, and elsewhere in the Midlands. On enquiry he was informed that the two specimens exhibited had been found in the Tottenham Marshes by Mr. C. J. Boden.

Mr. Porritt exhibited a series of specimens of *Cidaria russata*, from Yorkshire, the Isle of Man, the Hebrides, and the South of England. The specimens from the two first-named localities were almost black.

Mr. Verrall exhibited a specimen of *Mycetæa hirta*, Marsh., which was found devouring a champagne cork. The Rev. Canon Fowler remarked that certain *Cryptophagi* had the same habit. The discussion was continued by Mr. McLachlan, Mr. Jenner Weir, Dr. Sharp, and others.

Canon Fowler exhibited specimens of *Acronycta alni* and *Leiocampa dictæa*, which came to the electric light on Lincoln Cathedral during the Jubilee illuminations. He also exhibited a specimen of *Harpalus melancholicus*, Dej., from Kingsgate.

Mr. Billups exhibited, for Mr. Bignell, an interesting collection of British oak-galls. He also exhibited the cocoon and pupa-case of a South American moth from which he had bred 140 specimens of a species of *Ichneumonidæ*.

Mr. O. Janson exhibited, for Mr. C. B. Mitford, a collection of *Lepidoptera* from Sierra Leone.

Mr. White exhibited a female specimen of *Composia olympia*, Butl., from Florida. He also exhibited a curious structure formed by white ants at Akyab, Burmah.

Mr. Waterhouse exhibited a series of diagrams of the wings of insects, and read "Notes of observations on the homologies of the veins"—a subject to which he had given especial attention for some time past. Mr. Champion, Mr. Verrall, Mr. McLachlan, Dr. Sharp, Mr. Poulton, and others took part in the discussion which ensued.

Mr. G. T. Baker contributed "Descriptions of new species of *Lepidoptera* from Algiers."

Mr. Gervase F. Mathew, R.N., communicated a paper entitled, "Life-histories of *Rhopalocera* from the Australian Region." The paper was accompanied by elaborate coloured drawings of the perfect insects, their larvæ and pupæ.

Mr. Frederic Merrifield read a "Report of Progress in Pedigree Moth-breeding, with observations on incidental points." He also exhibited a large number of specimens of *Selenia illustraria*, showing the results of the experiments he had been making.

Mr. Francis Galton alluded to the close attention Mr. Merrifield had given to the subject, and complimented him on the neatness, ingenuity, and skill with which his experiments had been conducted, and on the results he had obtained therefrom. Mr. Poulton, Dr. Sharp, Prof. Meldola, and others continued the discussion.—H. Goss, *Hon. Secretary*.

COLEOPTERA AT ARMAGH, &c., IN 1887.

BY REV. W. F. JOHNSON, M.A.

The past year has been on the whole a very successful one with me, and I have added a large number of species to my list.

Moss in January produced the following: *Helophorus arvernicus*, *Homalota elongatula*, *H. circellaris*, *Tachinus laticollis*, *Bolitobius atricapillus*, *B. exoletus*, *B. pygmæus*, *Philonthus nigritulus*, *Cryptobium fracticorne*, *Sunius angustatus*, *Stenus Argus*, *S. fuscipes*, *Oxytelus sculptus*, *Megarthrus denticollis*, *Scymnus Mulsanti* (very sparingly), *Plectroscelis concinna*, *Thyamis obliterata*, *Sitones tibialis*, *S. lineatus*, *Hypera polygoni*, *H. variabilis*, *H. Pollux*, and *Orobitis cyaneus*; of this last I only took one example at Lowry's Lough, possibly it may turn up again this season. At the edges of ponds I took several *Parnus prolifericornis*.

In February, moss produced several of the above, together with *Pterostichus vernalis*, *Homalota volans*, *Xantholinus atratus*, *Quedius semiæneus*, *Lathrobium terminatum*, *Cryptophagus pubescens*, and *Agathidium lævigatum*. The water-net procured me *Hydroporus obscurus*, *H. vittula*, *Noterus clavicornis*, *Laccobius alutaceus*, and *Hydræna nigrita*.

From moss in March I took *Dromius melanocephalus*, *Aleochara nitida*, *Stenus flavipes*, *Ceuthorhynchidius troglodytes*, and *Hypera rumicis*. Under stones were found *Anchomenus oblongus*, *A. gracilis*, and *Liosoma ovatulum*, while a log of wood produced from its underside *Stenus bimaculatus*, and sweeping the early herbage *Psylliodes napi*. I noticed a great variety of *Steni* appearing at this time under stones, pieces of wood, &c.

In April, I took by sweeping the side of a drain, one *Dyschirius thoracicus*. *Bembidium Clarkii* and *B. flammulatum* turned up on the shores of Lowry's Lough. Of *B. Clarkii* I have since taken several in moss from the Mullinures in November and December. The Mullinures, which are low-lying marshy meadows, also produced *Pterostichus versicolor*, *Amara aulica*, *Agabus unguicularis*, *Cercyon depressum* (only one specimen), and *C lugubris*. The other principal captures of the month were: *Haliplus confinis*, *Tachinus marginellus*, *Mycetoporus longulus*, *Cryptophagus saginatus*, *Apteropoda graminis*, *Alophus triguttatus*, *Barynotus mœrens*, and *Rhinoncus pericarpius*.

May brought me several good things. In the immediate neighbourhood I took *Deronectes 12-pustulatus*, *Hydroporus rivalis*, *Cercyon terminatum*, *C. pygmæum*, *C. obsoletum*, *Phyllobius argentatus*. At

Lowry's Lough, *Blethisa multipunctata*, *Chlænius nigricornis*, *Anchomenus gracilis*, *Anisodactylus binotatus*, *Cœlambus 9-lineatus*, *C. 5-lineatus*, *Staphylinus erythropterus*, *Monotoma picipes* occurred, together with quantities of *Pelophila borealis*, *Anchomenus marginatus*, *Elaphrus riparius*, and such like. Having a holiday on the 24th, I went over to Portsdown, and in the People's Park there took *Laccophilus obscurus*, *Cœlambus versicolor*, *Noterus sparsus*, *Hydrobius fuscipes*, *Xantholinus punctulatus*, *Tachyporus obtusus*, *T. hypnorum*, *Telephorus testaceus*, *Lathridius lardarius*, *Agriotes obscurus*, *Corymbites quercus*, *v. ochropterus*, and *Litodactylus leucogaster*. On the same day I was driven down to the Derryadd shore of Lough Neagh, and allowed half an hour to hunt; I managed to pick up the following: *Pelophila borealis*, *Anchomenus piceus*, *A. fuliginosus*, *A. viduus*, *Bembidium bipunctatum*, *B. littorale*, *Haliplus obliquus*, *Lesteva longelytrata*, *Silpha sinuata*, and *Silpha dispar*. All were under and in water-plants and other rejectamenta on the sandy shore.' On the 28th, I drove down to Maghery, on the shore of Lough Neagh: under stones on the shore of Derrywarragh Island were quantities of *Pelophila*, together with the commoner *Anchomeni* and *Bembidium bipunctatum*. Under rejectamenta was one *Silpha sinuata*; and, on crossing over to the sandy shore under the village, I found, after a long search, one *Silpha dispar*. On reeds on the canal margin several *Donacia sagittariæ* occurred.

June was, as usual, replete with insect life. *Blethisa multipunctata* and *Chlænius nigricornis* gladdened my eyes at Lowry's Lough. At Ardtrea, in the County Tyrone, I took *Athous niger*, *Phratora vulgatissima*, and *P. vitellinæ* on willows; *Cercyon granarius*, *Aphodius merdarius*, and *A. rufescens*, in dung. An expedition to Carlingford Mountain procured *Olisthopus rotundatus* under a stone, *Philhydrus melanocephalus* in a boggy pond, and *Dascillus cervinus* on ling; on the shore I got *Arpedium brachypterum*. Nearer home, I took *Anthonomus pedicularius*, *Ceuthorhynchideus melanarius*, *Phyllobius viridicollis*, *Atomaria atricapilla*, *Adrastus limbatus*, *Donacia lemnæ*, &c.

July being holiday time, I was able to make several excursions. Two of these were to Lough Neagh, calling on my way at Churchill, where there is a capital hunting ground on a heathy bog. At the latter place, I took *Coccinella ocellata* and *C. oblongopunctata*, flying and beaten from fir trees; also *Elater pomorum* and *Rhynchites betulæ* on birch trees. At Lough Neagh my chief captures were *Chlænius vestitus* and *Phyllobrotica quadrimaculata* on Coney Island, solitary specimens of *Silpha dispar* and *S. sinuata*, a number of *Cryptophagus* *cellaris*, which were flying towards evening, and settled on Mrs. Johnson's dress, and one *Chlænius nigricornis* under a stone. I spent a week at Keady, which is a few miles from this, but much higher; here I found at Clay Lake *Pelophila borealis*, *Bembidium punctulatum*, *B. atrocœruleum*, and an *Anchomenus*, which looks like *gracilipes*. About Keady I also took *Agabus unguicularis*, *A. guttatus*, *Megasternum boletophagum*, *Agriotes obscurus*, *Hypera trilineata*, *H. polygoni*, *H. rumicis*, *Sitones flavescens*, *Alophus triguttatus*, and *Gastrophysa raphani*. A drive to Loughgall procured me, with other things, *Adrastus limbatus*, *Baridius T-album*, and *Galeruca tenella*; and a wet day at Portneligan, a quantity of *Cassida equestris* and *Phratora vulgatissima*, also *Baridius T-album*. The only home captures worth mention are: *Haliplus flavicollis*, *Gyrinus minutus*, *G. marinus*, *G. bicolor*, *Cœliodes quadrimaculatus*, and *Apion craccæ*.

August was not quite a blank, for I took *Cryptophagus dentatus*, *Adimonia tanaceti*, and *Apion humile*. His Grace the Primate gave me a couple of *Necrophorus ruspator*, which he got under a dead corncrake, and one of my pupils brought me *Homalium concinnum* and *Cryptophagus scanicus*.

September's best captures were: *Bembidium* 5-*striatum*, *Hydrochus elongatus*, *Octhebius pygmæus*, *Hippodamia* 13-*pustulata*, *Enicmus transversus*, *Donacia dentata*, *Thyamis holsatica* (in moss), *Apion carduorum*, *A. striatum*, *A. immune*, *A. tenue*, *A. subulatum*, *A. frumentarium*, *Ceuthorhynchus viduatus*, and *Erirhinus æthiops*; of this last I took a considerable number on the leaves of *Iris pseudacorus* and *Sparganium ramosum*, in the Mullinures.

October's work produced a single specimen of *Hydroporus Davisii*, two of *Philhydrus testaceus*, one of *Dytiscus punctulatus*, one of *Donacia sericea*, along with several *Stenus pubescens*, *S. binotatus*, *S. pallitarsis*, and *Thyamis holsatica*.

For November I have but little to record, the only capture new to my list being *Phyllotreta tetrastigma*. Besides this, my most important capture was *Bembidium Clarkii*, which I got in moss from the Mullinures; along with it occurs another *Bembidium*, which I erroneously recorded as *B. fumigatum* (p. 16). It is, however, certainly not *fumigatum*, and it has been suggested to me that it is merely an immature form of *B. Clarkii*. As this opinion is advanced by those more experienced than myself, I do not like to dissent, but I have kept two of these beetles alive for more than three weeks, and they show no signs of becoming more like *Clarkii* now than at first, so I am, if possible, more puzzled than ever.

December, I may say, has been a blank, as I was prevented by other occupations from doing anything at the *Coleoptera*. Two bags of moss from the Mullinures produced examples of *Bembidium Clarkii*, and its immature (?) form, *B. Mannerheimi*, *B. guttula*, *B. obtusum*, *Bryaxis fossulata*, *B. juncorum*, *Tychus niger*, *Bythinus puncticollis*, and a host of others of the vulgar sort.

I hope this account of the past year's work here may, perhaps, stir up some of the Irish readers of the Ent. Mo. Mag. to take up the study of the *Coleoptera*. Ireland is a rich field, and will amply repay those who take the trouble to work it.

Winder Terrace, Armagh:
January 3rd, 1888.

[The Irish list of *Coleoptera* is so very imperfect, that in many cases the commonest species have not yet been recorded; any notes, therefore, like the above are most valuable, and it is to be hoped that other Irish collectors will devote more of their time to the *Coleoptera*. —W. W. F.]

BRITISH *HEMIPTERA*: ADDITIONAL SPECIES.

BY JAMES EDWARDS, F.E.S.

CHLAMYDATUS FLAVEOLUS, Reut.

Reuter, Not. Fenn., xi, 323, 4, t. 1, fig. 6.

I have taken the true species of this name in marshy places at the roots of grass and rushes at Ranworth, Hellesdon, and Coxford in Norfolk. It may be readily distinguished from *C. pygmæus* (= *Tytthus insignis*, D. & S.) by its entirely greyish-yellow colour, larger size, and much stouter build. In the undeveloped form, which is the usual one, the elytra are much shorter than the very convex abdomen, and truncate at the apex. *C. pygmæus* is a much smaller and more delicate insect, and always has at least the head black.

LIBURNIA PELLUCIDA *and its allies.*

My first notions of *Liburnia pellucida* were formed from a long series named for me by one of our authorities on these insects. These specimens were certainly very diverse in appearance, but the males all agreed in having the apical angles of the upper notch of the pygofer right angles or nearly so. Later on I became aware that these different forms did not occur in company, and on attempting to classify my male specimens according to their general appearance, I found that they naturally fell into three groups; the first characterized by its conspicuously white pronotum, the second by its black colour and brownish-yellow elytra, and the third by its entirely black appearance owing to its black body and pitch-brown elytra. Subsequent investigation shows that these three forms really represent three structurally distinct species, the males of which may be characterized as follows:—

1 (2) Pronotum (except a black patch behind each eye) white. Penis a blunt deflexed hook (fig. *c*) ....*pellucida*, Fab.
2 (1) Pronotum black or blackish, hind margin very narrowly pale.
3 (4) Elytra brownish-yellow. Penis bifid to base (fig. *b*) ....*difficilis*, *n. sp.*
4 (3) Elytra pitch-brown. Penis bifid, but not to the middle (fig. *a*) *discreta*, *n. sp.*

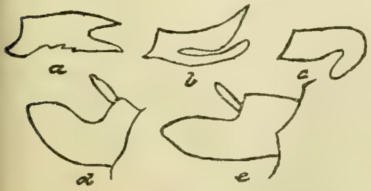
In a series of specimens several examples will always be found in which the penis is so far exserted that the characters given above may be observed with an ordinary Coddington or similar lens, the "appendicibus connatis perpendicularibus" of the anal tube described by J. Sahlberg and figured by Fieber being in reality two large flat hooks which grip the penis between them. The three species above named all occur by sweeping in marshy places, and are all included in my description of *L. pellucida* in Trans. Ent. Soc. Lond., 1886, p. 78. I cannot now give any certain characters by which the females of these three species may be separated.

LIBURNIA PUNCTULUM, Kbm.

Kirschbaum, Cicad., 25, 10.

This is a good species, and not merely a synonym of *L. pallidula*, Boh., as may be seen from the following comparative characters:—

L. PALLIDULA.	L. PUNCTULUM.
Length, 2¾—3 mm.	Length, 3¾—4 mm.
Cheeks very rarely with a punctiform black spot.	Punctiform black spot on the cheeks very rarely wanting.
Middle nerve of elytra brown at the apex, the colour very rarely reaching beyond the middle.	Middle nerve of elytra black to the base, brachial nerve and and those of the clavus frequently black.
Appendages of anal tube reaching straight out behind (fig. *e*).	Appendages of anal tube distinctly curved upwards (fig. *d*).



My description of *L. pallidula* (*l. c.*, p. 65) belongs to *L. punctulum*, and the female examples there queried as a distinct species are *L. pallidula* proper.

LIBURNIA REYI, Fieb.

Fieber, Grundz. Delph., 11, 7, t. 8, fig. 31 (♂ genitalia).

Crown nearly double as long as wide; elytra transparent, about two-thirds as long as the abdomen, hind margin narrowly blackish; legs pale, abnormally long, knees (especially the hinder pairs) with a distinct black spot. ♂, pronotum white, with a black patch behind each eye, side keels not reaching the hind margin; scutellum black; abdomen black, the base widely and the last segment yellow; pygofer yellow above, black beneath. ♀, dirty brownish-yellow, with pitchy markings on the abdomen, resembling in contour the same sex of *L. notula*, but a little larger.

I found this fine species amongst rushes in a marsh at Weybourne, Norfolk, in August last, in a situation which would not be readily accessible in any but an abnormally dry season.

131, Rupert Street, Norwich:
December 31*st*, 1887.

ACENTROPUS NIVEUS IN NORFOLK.

BY C. G. BARRETT, F.E.S.

On August 24th I went over to Stalham to meet my old friend Mr. Wheeler, and to spend a few hours in our old haunts, the fens. As we moved from the village we were delighted to see *Papilio Machaon* (2nd brood) flying across from fen to fen. (I hope that the pleasure was reciprocal, for we could by no means follow or interfere with them). We looked longingly and proceeded. In crossing Barton Broad we suddenly found that our boat was an object of pursuit; not that there was cause for alarm, our pursuers were not dangerous, being only very lively little males of *Acentropus niveus*, which we had disturbed from their resting places on the floating weeds, and which were consequently eager to find something solid whereon to rest.

Their movements were most curious, as they did not rise from the surface of the water, but buzzed along it in a zigzag course, moving their wings with great velocity, and really making very respectable progress. On looking down we found that some had overtaken us, and had climbed on to the rudder, where they remained quiet just clear of the water, and were boxed without difficulty, as were the pursuers as they came up. Of course our movements often caused them to be immersed, but to this they appeared totally indifferent. We now searched the floating weeds and rubbish, and found more males than we cared to take, but with all our care were unable to meet with a female. The bottom of this Broad is nearly covered with *Stratiotes aloides* (water soldier), and we pulled up many plants and examined their prickly leaves, as well as the smooth glossy ones of *Potamogeton lucens*, and other plants, but without success.

We could not spare very much time for *Acentropus* (although this was the first occasion of our having met with it in numbers in this part of England), for Dr. Plowright (who was one of the party) was eager for Micro-fungi—rusts, smuts, cluster-cups, possibilities of all kinds; not many of them realized *that* day, so we ascended the Ant River and examined *Scirpus lacustris*, *Acorus calamus*, *Ranunculus lingua*, and many other interesting plants.

At night a lamp was lighted, of course, but a dense mist arose, and we did but little, except get wet. A couple of *Nonagria neurica* came (another had gratified me by jumping off a reed-stem as I passed in the twilight), also *Apamea fibrosa*, *Schœnobius gigantellus*, *Phibalapteryx lignata* commonly, *Peronea Shepherdana*, the white form of *Hydrocampa stagnalis*, and a few other things; and although this was gratifying to me (in spite of soaked feet) after so many years of absence, it was not such a night as one hopes for in the fens.

When returning in the morning there was no time to look after *Acentropus*, but being dissatisfied with our failure to find females, I sent my son over there a few days later. He pulled, with much labour, across the Broad in the teeth of a violent breeze which had inopportunely got up, but, from the roughness of the water, scarcely an *Acentropus* could be found. He filled a great basket with as much as he could well bring home of pulled-up plants of *Stratiotes*, *Potamogeton*, *Zannichellia*, &c., but the result was utterly disappointing. Hours were spent over them, but not a female nor a cocoon could I find.

A day or two later I found *Acentropus* in plenty in a pond not half a mile from my own house; rather humiliating to have sent a messenger a journey of over 100 miles after it; but here again it seemed impossible to find a female. There was no boat on this pond, but, with a water net, I fished up floating weeds, swept growing plants, and pulled some up from the bottom, and at last I did find one miserable half-crushed wretch with partially developed flaps of wings, such as she might well be ashamed of. Search at twilight and at night with a lamp yielded no further result, and the probability seems to be that *here* the females are semi-apterous, and having no temptation to fly (in the absence of the power), they keep themselves secluded among the weeds at the bottom of the water. But, as the species *must* at times move to fresh ponds, I still cherish the hope that, perhaps in an earlier brood, well developed females with large wings, such as used to be taken at Hampstead, and elsewhere, will yet be found here.

King's Lynn, Norfolk:
January 16*th*, 1888.

TROPICAL AFRICAN *COLEOPTERA*; CHIEFLY FROM THE ZANZIBAR MAINLAND.

BY H. W. BATES, F.R.S., &c.

(*Continued from Vol.* xxiii, *p.* 57).

Drimostoma explanatum.—D. Westermanni (Chaud.) *proxime affine sed differt thoracis lateribus lævibus, etc. Sat late oblongum sub-convexum, piceo-nigrum politum, partibus oris antennis pedibusque piceo-fulvis; palpis apice recte truncatis; capite brevi, sulcis frontalibus profundis usque post oculos extensis, sutura frontali profunda ibique epistomatis margine plicato; angulis lateralibus* (*supra antennis*) *dilatatis reflexis: thorace lato, toto impunctato, lateribus sat regulariter arcuatis, late et regulariter a basi usque ad apicem explanato-reflexis, lineis transversis nullis, sulculo dorsali acuto integro, sulcis basalibus linearibus profundissimis, angulis basalibus dentiferis: elytris basi dilatatis, humeris rotundatis nec dentatis, acute et profunde striatis striis fundo punctulatis vix crenatis, interstitiis latis fere planis; corpore subtus lævi.* *Long.*, 9½ *mm.*

Cameroons; one example. Belongs to the small group of the genus in which the antennæ are slender, not moniliform, and the elytra broadly oblong-ovate.

Drimostoma euglyptum.—D. punctifronti (Chaud.) *affine; gracilius ovatum elytris convexioribus; piceo-nigrum politum, partibus oris antennis pedibusque rufis: fronte utrinque grosse confluenter punctata, sulcis obtectis: thorace parvo sub-rotundato, angulis posticis obtusis denticulo parvo, supra lævissimo, margine subtili, sulcis basalibus late excavatis: elytris crenato-sulcatis interstitiis convexis; meso et metasternis ventreque utrinque punctatis. Antennæ moniliformes.* *Long.*, 5 *mm.*

Old Calabar.

Galerita rubens.—*Magna, elytris elongato-ovatis versus basin perparum angustatis, costis parum elevatis interstitiisque alutaceis subtiliter sparsim setifero-punctulatis; capite thorace antennis pedibus et pectore rufis subnitidis, elytris nigris, abdomine fusco basi rufo: capite sat gracile post oculos semi-ovato; thorace medio rotundato-dilatato, antice gradatim longe rotundato, postice valde sinuatim, angustato, angulis posticis paullo exstantibus, capite et thorace sat crebre hic illic rugulose punctulatis, nitidis.* *Long.*, 26 *mm.*

Old Calabar.

Differs from all other African species by its broad elongate-ovate elytra, the costæ of which are narrow and much less elevated than in *G. femoralis*, and the shoulders a little less marked.

Anthia præsignis.—A. Petersii (Klug) *affinis, thorace pone dilatationem abrupte sinuato-angustato elytrisque valde elongatis parallelis. Nigra, subnitida, supra breviter nigro-setosa; thorace vitta laterali* (*basin haud attin-*

genti) elytrisque margine et macula rotundata prope basin inter carinas 5^{am} *et* 7^{am} *cretaceo-tomentosis: thorace sicut in* A. Petersii *et* A. Burchellii *grosse punctato, elytris costis utrinque angustioribus octo, interstitiis* (*sulcis*) *haud pilosis fere triseriatim punctulatis apiceque distincte oblique truncatis.*

Long., 44 *mm.*, ♂.

Mamboia (Mr. Last).

The white pubescent lateral margin of the elytra is strongly contrasted with the deep black of the rest of the surface, and forms a sharply-defined border, extending from the 8th rib to the margin, but it does not quite reach the base, and is there accompanied by a small spot lying between the 7th and 8th ribs, and a larger rounded and more densely tomentose spot situated between the 5th and 7th ribs, both of which latter are curved, and the 8th depressed to form a rounded pit for its reception. The punctuation of the thorax and under-side is very similar to that of the two species named.

ANTHIA PULCHERRIMA.—*Gracilis, elytris elongato-ovatis convexis apice sinuato-truncatis. Nigra supra opaca subtus nitida; capite fere sicut in* A. biguttata (Bon.) *elongato, oculis parum prominentibus, confluenter punctato fulvo-pubescenti, vertice et occipite medio unicarinatis sulcis frontalibus curvatis postice conjunctis interspatioque planato: thorace parvo, dense haud grosse confluenter punctato, vitta mediana rufo-fulvo pubescenti, postice valde sinuato-angustato, basi verticaliter declivi: elytris vitta lata suturali alteraque marginali rufo-fulvo pubescentibus, pube adpressa, elytris singulis inter vittas septemcostatis foveisque duabus ochraceo-pubescentibus, prima discoidali reniformi ante medium, secunda obliqua medio prope apicem.*

Long., 32 *mm.*, ♀.

River Lujenda, East Africa (Mr. Last).

This beautiful species differs from all other *Anthiæ* in colours and markings, and in the sinuate-truncate apex of the elytra. In the length of its labrum, however, and general form, it agrees with *Anthia* better than with *Cycloloba*, which has similarly-truncated elytra. The tawny or ochreous-red pile which forms the central thoracic vitta and the sutural and marginal vittæ of the elytra, is long, dense, and laid transversely on a plane surface, and the ochreous discoidal spots lie in foveæ which break the continuity of the narrow shining costæ, the anterior spot occupying two, and the posterior four, of the costæ; the opaque interstices of the costæ form exceedingly deep and sharply-cut grooves.

Fam. *COPRIDÆ.*

SCARABÆUS PLATYNOTUS.—*Latus mediocriter convexus, supra purpureo-cupreus, viridi-æneo relucens, subopacus; clypeo angulariter reticulato-punctato, vertice aspere granulato, tuberculo medio parvo acuto, genis reticulatis* *margine laterali serratis apice sinuato-truncatis: thorace latissimo; granulis rotundatis nigris nitidis minus crebre adspersis, linea dorsali spatiisque posticis lævibus opacis: elytris crenato-striatis interstitiis (suturali excepto) alutaceis atomis nitidis cupreis crebre obsitis et sat confertim foveolatis. Pygidium metallicum opacum aspere granulatum, copore subtus nigro-nitidum. Pedes nigri, tibiis intus nigro-pilosis. Femora antica subtus longe ante apicem acute-dentata, tibiisque subtus medio acute dentatis inter dentem at apicem bituberculatis. Mesosternum apice haud productum obtuse rotundatum.* *Long.*, 36 *mm.*, ♀.

Nguru, East Central Africa (Mr. Last).

Nearest allied to *S. subæneus* (Harold), but amply distinguished by its much broader form, opaque upper-surface, the sparser and larger granulation of the thorax without trace of punctures, the very much larger foveæ of the elytral interstices, and other structural characters.

SCARABÆUS POROSUS.—*Convexus ænescenti-cupreus, nitidus: clypeo et genis reticulato-punctatis, vertice crebre punctato, tuberculo elongato lævi frontali, genarum lateribus extus incurvatis: thorace lateribus fere sicut in* S. ægyptiorum *granulatis, sed medio (præcipue postice) grossius punctato, vitta mediana (postice dilatata) et areola utrinque lævibus: elytris punctulato-striatis interstitiis* (1—3 *versus basin lævibus exceptis) subtilissime alutaceis, nitide atomatis et subseriatim grossius punctatis. Subtus cum pedibus splendide viridi-vel æneo-metallicus. Mesosternum ante coxas triangulare apice sub-compressum.* ♀. *Tibiæ posticæ fusco-fimbriatæ; femora antica inermia, tibiæ subtus versus apicem tuberculatæ.*

Long., 24—27 *mm.*, ♂ ♀.

Mpwapwa, E. Africa (Mr. Last).

Of the numerous metallic species allied to *S. ægyptiorum* and *S. cupreus*, most nearly allied to *S. festivus* (Harold). The two very nearly agree in the form and sculpture of the head and thorax, but the general colour is different: *S. porosus* being duller coppery, with strong brassy or brassy-green tints, and *S. festivus* rich coppery-red, greenish when viewed from behind, and the elytra are glabrous over two or three interstices in the basal moiety. The shape of the mesosternal process is also different, more pointed and compressed. Five examples of each have been compared.

ANACHALCOS AURESCENS.—*Oblongus aurescenti-cupreus parum nitidus, creberrime sicut in* A. cupreo *punctulatus; thorace valde transverso lateribus explanatis margineque late rotundato nec ante medium angulato.* ♂, *tibiæ posticæ prope apicem leviter curvatæ, apice intus perparum prolongatæ sulcoque inferiori (inter carinas ciliatas) sat angusto polito: pygidium apice medio alto reflexum recurvum, subtus in laminam ventralem politum dilatatum; abdomen punctulatum, segmento* 5^{um} *medio planum.*

Long., 25 *mm.*, ♂ ♀.

Usambara (Archdeacon Farler).

Distinguished from *A. procerus*, which is also an oblong species, by its very much smaller size and broader and shorter thorax (the thorax in *A. procerus* being for this genus remarkably long), and in the ♂ also by the shorter and less curved tibiæ, and the narrower groove of their under-surface.

ANACHALCOS MAGNUS.—*Quoad formam et colorem* A. cupreo *similis, sed multo major thoraceque margine laterali obtuse rotundato nec angulato. Creberrime punctulatus.* ♂, *tibiæ posticæ sicut in* A. procero *biflexuosæ sed minus elongatæ, apice intus sat prolongatæ et calcari brevi, sulco inferiori lato: pygidium apice medio alte reflexum (velut uncinatum) laminaque ventrali polita, segmento 5º medio transverse callosum.* *Long.*, 30 *mm.*, ♂ ♀.

River Lujenda, East Central Africa (Mr. Last).

In most of its characters, intermediate between *A. cupreus* and *A. procerus*, the latter of which was found in the same neighbourhood by Mr. Last. In *A. cupreus*, the apex of the pygidium in the ♂ is broadly rounded, and the margin equally and only slightly reflexed. This obtains both in East African and West African examples.

ONTHOPHAGUS LUJENDÆ.—O. lanistæ (Castl.) *affinis et similis; differt* (♂) *capitis cornu mox a basi deflecto medioque subtus valide unidentato, necnon thorace cornubus recurvis latioribus et brevioribus, antice profunde bifoveato et dorso late lævisulcato. Læte viridis elytris pygidioque fulvis, clypeo et pygidio fulvo-pilosis, thorace lateribus crebre punctatis.* ♀ *differt ab* O. lanista, ♀, *tantum thorace usque ad lobum basalem canaliculato, medio basi solum lævi.* *Long.*, 13—15 *mm.*

R. Lujenda (Mr. Last). A large series of examples offering no variation.

The species is almost exactly intermediate, in structure as well as in locality, between *O. lanista*, of the Cape and Natal, and *O. negus* (Raffray), of Abyssinia. In the latter, the large deep thoracic foveæ are within and behind the horns, in *O. lujendæ* they lie at the base and in front of each horn, and are smaller, rounder, and better defined.

ONTHOPHAGUS PLATO.—*Oblongus, latissimus, depressus, niger opacus; capite brevi semicirculari ruguloso-granulato; thorace dense sed discrete nitido-granulato, parum convexo antice medio leviter depresso, medio basi triangulariter breviter producto, margine laterali ante angulum basalem dentifero deinde sinuato; elytris sat acute punctulato-striatis interstitiis planissimis, minute discrete pilifero-punctulatis piliis griseis recumbentibus: subtus nigro-nitidus.*— ♂, *carina anterior subobsoleta, posterior in laminam latam obliquam elevata utrinque cornu valido compresso curvato apice subuncinato ante medium intus uniramoso: thorace disco tuberculis duobus altis acutis distantibus.* *Long.*, 31 *mm.*

Damaraland (Andersson).

Nearest allied to *O. rarus*, Guér.

(*To be continued.*)

MIGRATION OF INSECTS.

BY REV. CANON FOWLER, M.A., F.L.S.

The following notes have been kindly extracted for me by Mr. J. Cordeaux from his reports on the Migration of Birds published for the British Association. Mr. Cordeaux, who is the chief authority on this subject in the kingdom, has kindly promised to obtain for me further information regarding flights of *Lepidoptera*, &c., from the various lighthouses and lightships with which he is in communication; he informs me that the collection of *Lepidoptera* taken by Herr Gätke on Heligoland is extremely interesting, and would, probably, if examined by an expert, revolutionize many of our ideas of distribution.

The note given below from Heligoland is most interesting. If we had any doubt as to the powers of flight possessed by insects, the record "great numbers of *Bombyx neustria* east to west; numerous flights passing on," would serve to dispel it, when we remember that after leaving the small island they have 500 miles of sea to cross before reaching land; nor is this flight by any means surprising when we remember that small birds, like the gold-crested wren, regularly make the same flight, and some far greater ones. A short while ago Mr. Cordeaux showed me a small finch that had struck against a lighthouse in the North of Scotland, which must have come from Cashmere. If we reflect on these facts we shall see that there is nothing very extraordinary in species flying across the Channel; the only wonder is that more do not come, although it is probably a fact that many of the specimens of our ordinary species are foreigners, and species that have not been acclimatized would have no instinct to migrate. I hope, however, to be in a position to give further information on the subject before very long.

MIGRATION REPORT, 1884.

Heligoland.—Mr. Gätke writes, "Night, July 2nd to 3rd, thousands of *Plusia gamma*; 3rd, myriads of Dragon-flies; night, 21st to 22nd, great numbers of *Bombyx neustria*, east to west; 22nd to 23rd, the same; 27th to 28th, numerous flights passing on."

MIGRATION REPORT, 1885.

Happisburgh Lightvessel, Norfolk, June 7th, 4 p.m., S.S.E. (2) O.M.—"One death's-head moth, caught alive, several small white moths and black flies rested."

Languard Point Lighthouse, July 4th, 9.35 p.m.—"Millions of very small brown-coloured flies pitched on lantern glass, and had to be washed off to keep the light clear. They sting like a musquito. Wind S. (1), B.C.M."

Hanois Lighthouse, Guernsey, Sept. 13th, S.E., cloudy."—Silver gamma moth all the evening round lantern. Sept. 22nd, S.E., B.C.V., 2 p.m., Ants flying past lighthouse, some settled."

Rhinns of Islay Lighthouse, facing north coast of Ireland. Hundreds of moths are reported flying about the lantern on Sept. 7th, also on night of Sept. 3rd.—"We have had an enormous number of what are locally called 'Jenny Long-legs' about the station for the past three or four weeks, and in the morning there are great numbers of their legs and wings on the pavement. This morning, after putting out the light, I watched, when I saw about twenty 'mosscheepers' (*i.e.* Pipits) working hard to make their breakfasts from them. I never before saw so many 'Long-legs' in the fall. There is a usual run in April." (Messrs. Peter Anderson and James Ducat).

MIGRATION REPORT, 1886.

Fidra Lighthouse, East Coast, Scotland, under date Sept. 18th, Mr. Ross says:—"Had I known moths would have been of any use to you, I believe I could have given you a varied, rare, and enormous parcel. Last month it was moths everywhere after darkness set in—I had to sweep them down with a towel, some very large and beautiful." * * * "One beautiful specimen—not a moth, I think—of a size between a daddy long-legs and dragon-fly, and much the same shape; enormous bronze wings, beautiful vermilion body, black head, with a red (or yellow ?) streak (or spot ?), and antennæ more like a young lobster than any thing else."

Tees 5m *Buoy Lightvessel*, April 30th, 1886, Wind E., light.—"A great many bumble-bees and a few wasps during day, flying to N.W., several remained on board."

Coquet Island Lighthouse, Sept. 12th, W. (5)—"Hundreds of small flies all night in lantern."

Cockle Lightvessel, Norfolk Coast, Sept. 14th, 11 a.m., calm.—"Great quantities of bluish-coloured flies—left again at 1 p.m."

Languard Lighthouse, September.—"The musquitoes," Mr. Owen Boyle writes. "have been very numerous throughout the months of July, August, and September, They have been very troublesome; some people had swelled hands, puffed faces, and even black eyes from their stings." Oct. 4th.—"Ladybirds in large numbers on the breakwater at noon and up to sunset. At 3 p.m. they were to be seen in thousands."

Hanois Lighthouse, Guernsey, Oct. 31st, 8 p.m.—"A quantity of silver gamma moths, also a few brown ones, but smaller than the gamma."

January, 1888.

ASPIDIOTUS ZONATUS, FRAUENFELD.

BY ALBERT C. F. MORGAN, F.E.S.

ASPIDIOTUS ZONATUS, Frauenf., Verhandl. z.-b. Gesells. Wien, 1868, p. 888; Sign., Ess. Cochen., pp. 109, 511, 630, pl. i, fig. 14; Doug., Ent. Mo. Mag., xxiii, pp. 150, 151.

ASPIDIOTUS QUERCUS, Sign., Ess. Cochen., pp. 106, 511.

During the month of October last, and since, I have found in the neighbourhood of Oporto, in two situations, some distance from each other, an *Aspidiotus*, on the backs of the leaves of an oak (*Quercus robur*, var. *pedunculata*). The leaves were inhabited by both male and female scales, although the former were more numerous than the latter.

I at first thought that the species must be new, as the female insect does not entirely agree with any described species that I am aware of; but I am now induced to think that my specimens are *Aspidiotus zonatus*, Frauenf., = *quercus*, Sign., and that the females which have been described by Signoret (*l. c.*) and by Mr. Douglas (Ent. Mo. Mag., xxiii, pp. 150, 151) must have been young individuals, whilst those which I have found are the fully developed adults, and it will be necessary to give my reasons for coming to the above conclusion.

Signoret describes two species of *Aspidiotus* as feeding on the oak. His *A. ilicis* (Ess. Cochen., p. 97) cannot, I think, be identified with that which I have found, either from description or figure (*op. cit.*, pl. iv, figs. 3, 3*a*).

His description of *A. quercus* (*l. c.*) agrees in some respects with my examples; for instance, speaking of the scales, he says, "Celui des femelles est arrondi, celui des mâles très allongé, avec la depouille au centre et jaune." This description entirely agrees with my specimens; but, on the other hand, he states that he has not been able to see any groups of spinnerets in the female, whereas my specimens show four groups.

In describing the male, Signoret writes (*l. c.*), "Les antennes sont courtes." I did not find any perfect male imago on my oak leaves—only pupæ, but Mr. Douglas kindly sent me some leaves of the same species of oak as my own, and on those I found more than one male. These had elongate antennæ, about the length of the body of the insect.

Mr Douglas gives the measurement of his male scales as ranging from 1·075 mm. to 1·45 mm., and those of his which I measured I found to be about 1·115 mm., whilst my own measured about 1·25 mm. I do not see any difference between those which he sent me and my own, as regards colour or shape, and after making allowance for the important discovery by Mr. Douglas (*l. c.*) of the discrepancy as to measurement in Signoret's translation of Frauenfeld's description of *A. zonatus*, I do not think there is any reliable difference between the male insect and scale of the *A. zonatus*, Frauenf., and those found by Mr. Douglas and myself.

Signoret (*op. cit.*, p. 106), referring to his *A. quercus*, states that it appears to him distinct from *A. zonatus*, but he afterwards appears to have modified his opinion on this point, and refers to the two species as being synonymous (*op. cit.*, pp. 511, 630), and he finally affirms this to be the case in his letter to Mr. Douglas (Ent. Mo. Mag., xxiii, p. 151).

Therefore, as far as the male is concerned, there seems sufficient reason for concluding that my specimens are of the same species as those found by Dr. Signoret in France, Mr. Douglas in England, and by Frauenfeld in Austria, viz., *A. zonatus*.

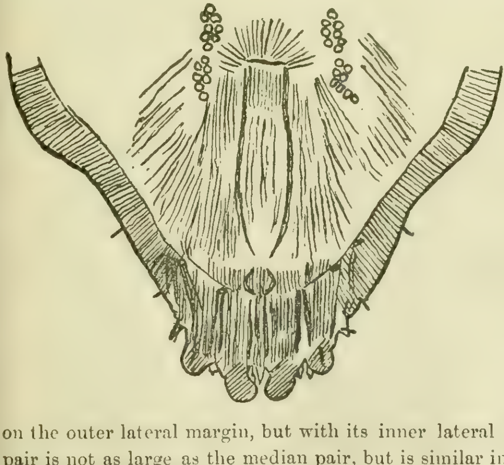
As regards the females, however, an important distinction between *A. quercus*, Sign., and my specimens consists in the absence of spinnerets in the former, and the presence of four groups in the latter, and on examining those received from Mr. Douglas, of which there were very few females, I find the same difference; but with this exception, viz., absence of spinnerets, Mr. Douglas' specimens show the same characters as my own. I should suppose that those which Mr. Douglas sent me are young females, as they were round and small, and with but little scale, also only one exuviæ; and the spinnerets are, I think, seldom seen in the *Aspidioti* until they are adult, or at least, until they have cast their skin twice.

I observe that Signoret, speaking of his *A. ilicis*, makes the following observation (Ess. Cochen., p. 98): "Dans beaucoup d'individus femelles, je n'ai pu voir les plaques de filières. Cela tient-il à la préparation ou y a-t-il quelques individus anormaux qui n'en prennent pas?" As far as my own limited experience goes, I find the spinnerets are not seen until the age of the insect is somewhat advanced. If I am right in concluding that Mr. Douglas' specimens were young, this will account for his measurement of the female scale being only half a millimètre, whilst mine measure one millimètre.

Mr. Douglas tells me that he only made one gathering, in September, 1886, of oak leaves, from the same tree; some he sent to Dr. Signoret, and some he sent to me. Signoret identified those which he received as being the same as his own—"Les échantillons sur chêne sont l'*Aspidiotus zonatus*, Frauenf., = *Asp. quercus*, Sign." (Ent. Mo. Mag., xxiii, p. 151), and I think there is no doubt that those which I received are the same as my own; we are therefore led to the conclusion that my specimens are the *Aspidiotus zonatus*, Frauenf., and it may now be desirable to describe the specific characters of the species, as Signoret's description, whilst not very detailed, must necessarily be modified, and Frauenfeld only describes the male.

The female scale measures about one millimètre, of a smoky-white colour, and more or less elliptical form. The body of the insect may be seen underneath the scale, the two exuviæ lying transversely with it. Exuviæ naked, situated in the centre of the scale.

The female insect measures rather less than a millimètre, about ·9 mm. Form oval, segmentation distinct, with marginate and undulated margin. The last segment shows the following characters (see figure):—Four groups of spinnerets, each consisting of from five to eight. The anterior group is situated so close to, as almost to form one with, the posterior group. There are three pairs of lobes, the first and second pairs being well developed, but the third pair is frequently merely rudimentary. The median pair is the largest, rounded at the posterior end, with a notch on the outer lateral margin, but with its inner lateral margin entire. The second pair is not as large as the median pair, but is similar in shape and character, whilst the third pair is inconstant. The bases of the lobes seem to extend anteriorly into the body, making it appear longitudinally plicated. These are I think what Prof. Comstock terms "thickenings of the body wall," and they are remarkably noticeable in this species, especially if the insect is observed before being thoroughly prepared for microscopical examination.



The spines or hairs are not very conspicuous, and are situated as seems most usual with the *Aspidioti*, *i. e.*, one at the base, rather laterally of each of the lobes, and there are sometimes to be seen one minute hair about a quarter and another about half-way between the apex of the last and the commencement of the penultimate segment.

The plates are very small, and are not always visible, but there seem to be two simple plates between the median lobes, and two similar ones between the first and second lobes, as well as two anterior to the third rudimentary lobe.

The male scale has already been well described by Mr. Douglas (*op. cit.*).

The male insect measures about ·8 mm. from front of head to tip of wings, when the latter are lying incumbent. It is of a yellow colour, mottled with orange-brown. Antennæ elongate, pubescent, 10 jointed. The basal and 2nd joint short, the 3rd, 4th, 5th, 6th and 7th are the longest and are equal, the 8th, 9th and 10 being shorter and sub-equal, the last joint suddenly constricted at the tip and terminating with a hair. Wings white; one branched nervure.

Thoracic transverse band very dark, almost black. Usual balancers, terminated with a hooked bristle. Exserted genital organ about half the length of the body.

Villa Nova da Gaya, Portugal:
January 6th, 1888.

[I quite agree with the author's conclusions.—J. W. D.].

Note on Orthezia insignis (*cf.*, p. 169 *ante*).—From the Botanic Gardens, Cambridge, Mr. R. Irwin Lynch, the Curator, has had the goodness to send me living examples of this insect on *Eranthemum nervosum*, a plant of the same Natural Order as *Strobilanthes* (*Acanthaceæ*), on which I had it from Kew, and Mr. Lynch kindly supplies the following information. "No doubt the insect came from Kew, where I knew it years ago, but certainly it did not come upon the *Eranthemum*. It is numerous enough on a specimen of this plant, and I think it does about as much harm as a mealy bug. I believe I have seen the insect on other *Acanthaceæ*, but not on a plant of any other Order." In a note on this species by Mr. Edward T. Browne, published in the "Journal of the Quekett Microscopical Club," Ser. ii, Vol. iii, No. 20, Dec., 1887, he states that at the Royal Gardens, Kew, "the insects have been gradually spreading, in spite of the measures taken to annihilate them: now they may be found on *Scutellaria* and other foreign plants in an adjoining house."

On the two small terminal shoots of the *Eranthemum* sent by Mr. Lynch were several examples of the adult female fixed by the rostrum immersed to its base in the stem; a few ♀ without marsupium wandering about; and a great many very small larvæ, some of them just hatched, all the very miniatures of their mothers before the development of the postnuptial marsupium; these were stationary on and sucking the stem. The motto of the Horticultural Society "*Alienis mensibus æstas*" is as applicable to these insects as to the exotic plants on which they feed, for now, in our mid winter, under the fostering influence of artificial warmth, they are as lively as others of their race were in summer time.—J. W. Douglas, 8, Beaufort Gardens, Lewisham: *January 19th*, 1888.

ON SOME NEW OR LITTLE KNOWN BRITISH PARASITIC *CYNIPIDÆ*.

BY P. CAMERON, F.E.S.

1. *The parasitic Cynipidæ described by Prof. Westwood in the Mag. of Nat. Hist.*, 1833.

Prof. Westwood has very kindly lent me for examination his type specimens, and this has enabled me to clear up some doubtful points in synonymy :—

Eucolla crassinerva. This is *E. maculata*, Htg., as indicated by Dahlbom (Skand. Hym., 1846, No. 20). It forms the type of Förster's genus *Psilodora.*

Kleidotoma psiloides = *K. bicolor*, Gir. = *K. ruficornis*, Thoms.

Anacharis rufipes = *Ægilips Dalmani*, Reinhard.

Anacharis fumipennis. This is a hitherto unrecognised species of *Ægilips.* It has the scutellum formed as in *Dalmani* (or, as it must be now called, *rufipes*), *striolata*, and *bicolorata* (*cf.* Cameron, Trans. Ent. Soc., 1883, p. 374). From the latter two it is readily known by the mesonotum not being transversely striolated ; from *rufipes* by the thorax being densely pilose, by the scutellum being somewhat shorter, by the petiole being longer, it being three times longer than broad, and piceous, this being also the case with the base of the abdomen ; and by the wings being uniformly smoky. The legs are testaceous. As it is not described in any continental work, I give a description of it here :—

ÆGILIPS FUMIPENNIS, Westwood.

Black ; the legs testaceous ; mandibles piceous-red, darker at the apex ; petiole and base of abdomen piceous ; flagellum of antennæ fuscous. Antennæ shorter than the body ; thorax densely pilose ; parapsidal furrows shallow, indistinct ; scutellar foveæ indistinct ; scutellum obtuse, rugose ; metanotum rugose, tricarinate ; petiole three times longer than broad, striolated ; abdomen shining ; wings uniformly smoky ; first abscissa of radius three-fourths the length of second ; nervures fuscous.

Length, 2·5 mm.

The following is a synopsis of the British species of *Ægilips :*

1 (12) Scutellum conical, not ending in a spine.
2 (5) Scutellum smooth, impunctate in front and at the sides.
3 (4) Scutellar foveæ obsolete ; legs and antennæ bright yellow...*nitidula*, Dal.
4 (3) „ „ distinct ; legs and antennæ red ....*ruficornis*, Cam.
5 (2) Scutellum rugose.
6 (9) Mesonotum transversely striated.
7 (8) Scutellar foveæ almost obsolete, mesonotum shining ; first abscissa of radius one-half the length of second ; legs testaceous and yellow... *striolata*, Cam.

8 (7) Scutellar foveæ deep; mesonotum opaque; first abscissa of radius scarcely shorter than second; legs dull red ... .*bicolorata*, Cam.

9 (6) Mesonotum not transversely rugose.

10 (11) Wings hyaline; thorax not deeply pilose; petiole twice longer than broad *rufipes*, West.

11 (10) Wings uniformly smoky, thorax densely pilose, petiole three times longer than broad ....*fumipennis*, West.

12 (1) Scutellum ending in a spine.

13 (14) Mesonotum semi-opaque, transversely striated, petiole much longer than broad (in ♂), foveæ at base of scutellum obsolete . *subulifera*, Thoms.

14 (13) Mesonotum not striated; scutellar foveæ large.

15 (16) Spine short, obliquely truncated at apex, not one-fourth the length of scutellum; legs fuscous; petiole shorter than broad ......*scotica*, Cam.

16 (15) Spine long, curved, more than one-third the length of scutellum; legs and antennæ red; petiole a little longer than broad .... *armata*, Gir.

PHÆNOGLYPHIS FORTICORNIS, *sp. nov.*

Reddish-testaceous; the vertex and the top and apex of abdomen, castaneous; the legs yellow, tinged with red; the antennæ fuscous, the basal five joints testaceous; wings hyaline, nervures fuscous; radial cellule elongated, narrow; the first abscissa of radius two and a half times the length of the second; antennæ longer than the body, stout. Eyes lead coloured. ♀. Length, 1½ mm.

Differs from *P. xanthochroa* in being smaller, in the antennæ being stouter and only yellowish at the base, in the vertex being broadly dark castaneous, in the radial cellule being narrower, and in the ground colour of the body being of a much more decided rufous tinge.

Förster makes no mention of *Phænoglyphis* having a longitudinal furrow on the mesopleura, and I cannot make out, owing to the bad condition of my representative of *P. xanthochroa*, if one is present in that species; but it is certainly present in *P. forticornis.* Further, Förster states that the radial cellule is not twice so long as broad, which is certainly the case in *xanthochroa*; and in it also the areolet is complete, another point in which it differs from Förster's description.

Förster describes a "genus" *Hemichrisis*, which agrees with *Phænoglyphis* in having the parapsidal furrows indicated (although not complete), while the scutellum has no fovea at its base. *Hemichrisis* is further defined from *Phænoglyphis* in the radial cellule being almost twice as long as broad, and the areolet is complete. The latter two points are merely specific, while no sharp line of demarcation can be drawn as to the completeness of the parapsidal furrows. Thus, the only real point of distinction between the two lies in, according to Förster, *Hemichrisis* not having a fovea at the base of the scutellum.

In *P. salicis* there is an obscure fovea at the base, so that this character cannot be said to be a valid one. Our three species may be defined as follows:—

1 (4) Body rufo-testaceous; second abscissa of radius twice the length of first.
2 (3) Antennæ entirely rufo-testaceous …… *xanthochroa*, För., = *rufa*, Thoms.
3 (2) „ fuscous, testaceous at base ………………………… *forticornis*, Cam.
4 (1) Body black; second abscissa of radius not twice the length of the first… *salicis*, Cam.

The European species of parasitic *Cynipidæ*, especially the *Allotrina* and *Eucoilina* stand very much indeed in need of revision, no work on the latter two groups having appeared since the publication of Thomson's Monograph of the Swedish species, now over a quarter of a century ago, beyond a few stray descriptions. There is great difficulty in obtaining specimens, and thus it is no easy matter to get material for a thorough revision of the European species. Being at present occupied with parasitic *Cynipidæ*, I shall be exceedingly obliged for the loan of any specimens from any part of the globe, but especially from Europe.

Sale, Cheshire:
December 13*th* 1887.

Lepidoptera at Armagh in 1887.—Although I devote most of my spare time to the *Coleoptera*, I pick up occasionally a few *Lepidoptera*, and, during the past year, made one or two good captures, at least from an Irish point of view. On January 14th a fine specimen of *Gonoptera libatrix* was brought to me by one of my pupils who had caught it in his bedroom. Pupæ dug in the autumn of 1886 produced *Tæniocampa stabilis*, *T. instabilis*, *T. gothica*, *Hadena thalassina*, *Phigalia pedaria*, Fb.,=*pilosaria*, Hb., D. L., &c. *Vanessa urticæ* first showed itself on March 26th. The "Whites" were not very plentiful in the early part of the year, but their larvæ made fearful havoc among the cabbages. However, the ichneumons were not idle, and I have seldom noticed so many of their little golden clusters of pupæ. In July I was astonished at seeing a specimen of *Argynnis Paphia* close to the town, a species I had never observed here before. I was unsuccessful in my endeavours to take it, but on August 8th I took two specimens at Benburb, on the borders of County Tyrone. *Vanessa Atalanta* also made its appearance in September, and I captured a very fine specimen, the only one I have ever taken here, though I have seen them occasionally. *V. cardui*, which generally visits us, did not show at all, much to my astonishment. *Lycæna Icarus* was unusually abundant and in fine condition. At Churchill, on July 2nd, I took a good number of *Cœnonympha Typhon*,=*Davus*, which Mr. Kane informs me has not been recorded from Ulster before, and is of the intermediate type between *Davus*, Fab., and the *v. Philoxenus*, of Yorkshire. At the same place I captured *Bombyx quercus*, *Odonestis potatoria*, *Nemeophila plantaginis*, *Strenia clathrata*, *Ematurga atomaria*, *Aspilates strigillaria*, and *Selidosema plumaria*,=*ericetaria*. Of this last I took quite a large series on a heathy bog just outside the Verner demesne, being late in the season, however, most of them were rather the worse for wear. From the stems of *Typha latifolia* I got some pupæ of *Nonagria typhæ,=arundinis*, of which four came to maturity. The Mullinures (low damp meadows just outside the town) provided me with *Zygæna filipendulæ*, *Z. loniceræ*, and *Z. trifolii*. *Amphipyra tragopogonis* occurred in numbers in holes in a poplar tree. Cocoons from Lowry's Lough produced two beautiful specimens of *Plusia festucæ*, and in my garden I took at night *P. v-aureum,=pulchrina*, *P. chrysitis*, *P. gamma*, *Xylophasia polyodon,=monoglypha*, *Triphæna janthina*, *Cidaria prunata*, *C. fulvata*, *Cerostoma xylostella*, *Xanthosetia Zœgana* and a multitude of others not worth mentioning. Lastly, *Sphinx convolvuli*, as already recorded (p. 132), was found dead outside a window by Mr. T. Smith, and I picked up *Triphæna fimbria* dead on a footpath, that being the first time I had met with it here. It will be seen from the above notes that the *Rhopalocera* are very poorly represented here, and the *Heterocera*, while more numerous and having some good species among them, are mostly of the commoner kinds as far as my knowlege of them goes at present.—W. F. Johnson, Winder Terrace, Armagh: *Jan. 4th*, 1888.

Tinea granella at King's Lynn.—This town, having a large import trade in corn, serves naturally as an opening for immigration of corn-feeding insects. *Ephestia interpunctella* sometimes abounds in, and outside, the warehouses—bearing a most comical resemblance when at rest to a *black oat grain* sticking against a wall—while *Gelechia cerealella* is at times even more plentiful, and still better concealed by its extraordinary resemblance to a bit of chaff. But the really important grain-pest here is *Tinea granella*. Its abundance is at times almost beyond belief, the streets near the river swarm with it on warm evenings to such an extent as to arouse the wonder of the inhabitants. In a corn warehouse I have found that the wooden upright supports and partitions wherever the wood was soft or slightly decayed were honeycombed on the surface with the holes made by the full-fed larvæ for pupation, and, in every protected corner, chink and cranny, the empty pupa-cases were still sticking out of these holes as thickly together as the hairs in a brush—thousands of pupa skins giving the wood an extraordinary appearance.

But the larvæ cannot always find soft wood into which to bore, and they wander out through doors and windows in search of some suitable place for pupation, and may be collected in scores under lintels, in the holes and interstices of bricks, or under boards or other articles lying upon the ground. They are warmly appreciated as delicate tit-bits by the swarms of sparrows which obtain their livelihood generally in a far less creditable manner from the heaps of grain, and it is most curious to see (as I can often from my office window) a hundred or more of these ubiquitous birds on the warehouse and dwellings opposite, a large party of them every now and then flying to, and hovering against, the granary wall, or even perching upon the roughest places and so picking out these wandering larvæ. The freshly arrived cargoes of grain from some warm climate furnish them in abundance and full-fed, and they seize such mild days as we have just experienced to seek their fortunes—to the great joy of the sparrows.

The larva is rather plump with deeply divided segments, and tapers slightly behind, yellowish-white, "fat-white," with head pale brown and jaws rather darker, dorsal plate very pale brown, shading at the margins into yellowish, divided in the middle, and also with a pale *transverse* line. Anal plate and feet yellowish-white. It emerges from pupa in the following summer, and has apparently two broods, but the natives are constantly reinforced by fresh arrivals from abroad, and as there is always grain in the warehouse so there, probably, are always larvæ feeding in it.—Chas. G. Barrett, King's Lynn, Norfolk: *January* 16*th*, 1888.

Note on Micropteryx salopiella, Stn.—The abundance of birch, both trees and bushes, on the heaths in this district afforded me last spring an opportunity, such as I have not had for many years, of renewing my acquaintance with several of the birch-frequenting species of *Micropteryx*. *Purpurella* was by far the most abundant, but *semipurpurella*, *unimaculella*, and even *Sparmannella* were to be found in fair numbers, although the last named species, from its partiality to large trees, was more difficult to secure. Very often the sexes were found paired, and an insight was thus afforded into the sexual differences in shape and colour of the fore-wings which obtain in some of the species.

This brings me to the object of the present note. I found that the females of *unimaculella* differ from the males in that their fore-wings are rather broader and more ovate, the pale blotch above the anal angle broader and hardly so crescent-shape, but extending more than two-thirds across the wing, and the remainder of the fore-wings beautifully clouded and mottled with purple and golden. When alive these markings were distinct and most noticeable (much more so than they are now), and I thought that I then understood, what has hitherto always puzzled me, why Dr. Wocke, in his (and Staudinger's) "Catalog," sunk *salopiella*, Stn., as the ♀ of *unimaculella*, an error which has, of course, been copied elsewhere.

I am not aware that *salopiella* has been taken on the continent, or if taken, recognised. It is local in England, but widely distributed, but, as far as I know, is not found in *this* district. My specimens were taken near Haslemere, Surrey. It is most closely allied to *purpurella* and *Sparmannella*, having the beautifully reticulated crimson-purple and golden markings of the former, with the broad-oval fore-wings of the latter, but its pale spot does not simply occupy the anal angle, *but is a broad triangle*, having its base on the dorsal margin of the wing and its apex very nearly reaching to the costa. It is altogether distinct from the female of *unimaculella*, and yet there is sufficient similarity in the descriptions to excuse one unacquainted with *salopiella* in making the mistake.—Id.: *November* 20*th*, 1887.

Coleoptera and frost.—The other day we had a snowstorm, but since then although it has frozen hard every night, the days have been warm and sunny. Walking down to West Cliff this morning, I noted the effect of the frost upon the *Coleoptera*; they were assembled in vast numbers under every available piece of wood or stone, presumably for the sake of warmth. It was on the Prairie, and there was no other available shelter, the *Yucca*, *Bigelovia*, &c., being useless for this purpose. It seemed as though every stone or log had under it an ants' nest, in which all the ants had become transformed into beetles. Most were *Geodephaga*, as might be expected—two or three species of *Bembidium* allied to *littorale*, a small *Pterostichus* about the size of *strenuus*, and an *Amara*; also two striped *Chrysomelidæ*, two species of *Coccinella*, some *Curculionidæ*, and others, together with some species of *Heteroptera*, a few small *Diptera*, an Homopteron of the *Cicada* group (black with a reddish margin), and many spiders. I also took one example of *Strachia*, which curiously resembled the more abundant of the two *Chrysomelidæ*, being marked with exactly the same tints of vermillion, black, and cream colour, and in a nearly similar manner. As the *Strachia* is in all probability disagreeable to the taste, I suppose this to be a case of protective resemblance on the part of the beetle. The only thing against this is the apparent rarity of the *Strachia*, which I have not seen elsewhere, while I have found the beetle also at Dillon on the Pacific slope, and near Saguache in the San Luis Valley.—T. D. A. Cockerell, West Cliff, Custer Co., Colo., U. S. A.: *November* 12*th*, 1887.

Haplocnemus impressus, Marsh.—A few days ago, while in the neighbourhood of Dean Forest, I made a search for this rare species in an orchard near Newnham-on-Severn, where I have taken it sparingly on one or two occasions under bark of old pear trees. I could not, however, discover the perfect insect, but obtained one larva; the species has been recorded rarely from the London district, the New Forest, Granville's Wootton (Dorset), Sutton Park (Birmingham), and Carlisle, and also from the Forth and Tay districts of Scotland. It is however, apparently, commoner than *H. nigricornis*, which has occurred near London, and has also been recorded from Hastings, the New Forest, Leicestershire and Yorkshire. In the latter county it has been taken by beating birches in woods in July. As a rule both the species are found under bark, but in summer they come out upon flower and foliage. By some authors *H. impressus* and *H. nigricornis* have been considered identical, but, apart from the fact that the latter species is dark bluish-green, and the former bronze or blackish-bronze, the punctuation of the elytra is rather coarser and more diffuse in *H. nigricornis*, and, in some specimens at all events, the thorax is more finely punctured; the structural differences are, however, it must be allowed, very slight.—W. W. Fowler, Lincoln: *January* 10*th*, 1888.

Nothochrysa capitata in Norfolk.—There appears to be some occult connection between an unusually hot summer and the occurrence of this rare "Lace-wing." At p. 69 *ante*, I recorded an example from Stourton, Wilts. My friend Mr. Barrett recently sent me two examples (out of three seen) taken at Bawsey Heath, near King's Lynn, by beating fir trees. He hopes to obtain more next year. I share this hope, but think its realization depends much upon the "season."—R. McLachlan, Lewisham: *November* 10*th*, 1887.

Notes on Philopotamus montanus, var. scoticus.—At Cloghereen, near Killarney, there is a swiftly flowing stream which is fed by a small lake, which, in its turn, is supplied by land springs, the water in both lake and stream even during August being icy cold; along the banks of the stream I captured large numbers of *Philopotamus montanus*, var. *scoticus*, but, although diligent search was made at intervals during five and six weeks, no example of the type of *montanus* could be obtained, whilst, at almost every other stream in the district, it occurred very commonly, although the variety was not obtained. Towards the top of Mangerton there is a spring-fed lake from which a stream flows (which, by the way, supplies the town of Killarney with water); only the ordinary type of *P. montanus* occurs along its banks, this stream appears to be very similar to the one at Cloghereen, excepting that it is at a higher elevation. The variety *scoticus* seems to be, upon the whole, a larger insect, the wings being more ample, but I could not detect any difference in the anal parts from those of the type. It may be worth mentioning that the ♀ of the variety *scoticus* appears to be much more scarce than that of the type. The proportion of the ♀ to the ♂ of *scoticus* being about 7 per cent., and of the type 27 per cent.—James J. F. X. King, 207, Sauchiehall Street, Glasgow: *January*, 1888.

[There is much yet to be learned with respect to the presumed varieties, based on colour characters, of *Philopotamus montanus.* I have already pointed out (Rev. and Synop. of European *Trichoptera*, p. 383) that Donovan's original figure of *montanus* resembles the var. *scoticus* rather than what we are accustomed to consider the "type" form. Then again there are the vars. *chrysopterus* (Morton) from Clydesdale, and *cesareus* (McLach.) from Jersey. Also the very striking form that I ventured to consider a distinct species, and described as *insularis*, from Guernsey. The presumed var. *cesareus* appears to be peculiar to Jersey to the exclusion of any other form of the species. The presumed species *insularis* appears equally peculiar to Guernsey, and exclusive there. But the presumed vars. *chrysopterus* and *scoticus* are in a somewhat different position. They are only isolated, inasmuch as they seem exclusively confined to certain streams within easy distance of localities where the so-called "type" occurs in abundance but without the vars. I bring these points prominently forward because they are fraught with importance. There is much yet to be learned.—R. McLachlan.]

Apatania muliebris, McLach.—Towards the end of August, during a short visit to London, I spent a day at Arundel in search of *Apatania muliebris*, McL., having had the locality indicated to me by Mr. McLachlan. Since his last visit it has been considerably changed, retaining walls for a mill pond have been erected, and the miniature waste-fall has been destroyed, but, notwithstanding the above serious alterations in the surroundings, I might have obtained any number of the species, at least, the ♀, for as yet the ♂ has not been taken.—Id.

[It is interesting to find that *A. muliebris* still holds its own, without the apparent necessity for a husband, in the old locality, notwithstanding changes in its very limited habitat. I have previously detailed my numerous visits to this locality, in former times, in the hope of finding the ♂.—R. McLachlan.]

Obituary.

George Robert Waterhouse, F.Z.S., died at his residence at Putney on the 21st of January, aged 77. A detailed notice will appear in our next No.

The South London Entomological and Natural History Society: *December 22nd*, 1887.—The President, R. Adkin, Esq., F.E.S., in the Chair.

Messrs. H. Hayward, F. E. Pow, F. S. Pilkington, M.D., W. R. Hicking, H. I. Smith, C. Kedgley, F. Livesey, E. A. Fitch, F.L.S., F.E.S., G. T. Porritt, F.L.S., F.E.S., J. A. Smith, W. Turpin, S. Mosley, J. Butterfield, W. Farren, I. Echersall, and the Rev. Canon Fowler, M.A., F.L.S., F.E.S., were elected members.

The only exhibits were a lilac-coloured variety of *Lycæna Icarus*, Rott., and an hermaphrodite specimen of *L. Corydon*, Fb., by Mr. C. B. Smith, and a fine irradiated variety of the under-side of *L. Icarus*, by Mr. A. C. Smith.

The Secretary read the Council's report from which it appeared that, during the year, 51 members had been elected, bringing the total membership to 148. The Treasurer read an abstract of the accounts, showing a balance to the Society's credit of £9 8s. 6d. The election of officers for 1888 was then taken with the following results:—Mr. T. R. Billups, F.E.S., President; Mr. John T. Carrington, F.L.S., Vice-President; Mr. E. Step, Hon. Treasurer; Mr. D. J. Rice, Hon. Librarian; Mr. W. West (Greenwich), Hon. Curator; Mr. H. W. Barker, Hon. Secretary; Mr. H. J. Turner, Hon. Assistant Secretary; Messrs. R. Adkin, F.E.S., T. W. Hall, F.E.S., R. South, F.E.S., W. H. Tugwell, J. W. Tutt, F.E.S., J. R. Wellman, and J. Jenner Weir, F.L.S., F.Z.S., F.E.S., Council.

January 12*th*, 1888: T. R. BILLUPS, Esq., F.E.S., President, in the Chair.

Messrs. F. W. Hawes, C. E. Runnacles, and A. E. D. Gould, were elected members.

Mr. J. Jenner Weir exhibited *Cicadetta hæmatodes*, and stated, as far as he knew, a dozen specimens had been taken during the past season in the New Forest; out of the dozen captured there was only one male. Mr. Tugwell, specimens of *Dianthæcia cæsia*, W. V., from Germany, and the dark variety from the Ise of Man; also a number of continental examples of reputed or very rare species of British *Lepidoptera*. Mr. Dobson, *Agriopis aprilina*, L., and a short discussion took place as to the reason of the colour in this species fading so quickly when compared with *Moma Orion*, Esp., and *Geometra papilionaria*, L. Mr. Tutt contributed remarks on the reputed appearance of *Acidalia strigaria*, Hb., in Kent, and suggested they might have been small specimens of *A. remutaria*, Hb. Mr. R. Adkin then read his Presidential Address for 1887, for which a vote of thanks was moved by Mr. Billups, seconded by Mr. T. W. Hall, and carried unanimously.—H. W. BARKER, *Hon. Sec.*

ENTOMOLOGICAL SOCIETY OF LONDON; *Fifty-fifth Annual Meeting*: *January* 18*th*, 1888.—Dr. DAVID SHARP, F.Z.S., President, in the Chair.

An abstract of the Treasurer's Accounts, showing a balance in the Society's favour, was read by Mr. H. T. Stainton, F.R.S., one of the Auditors; and Mr. H. Goss read the Report of the Council.

It was announced that the following had been elected as Officers and Council for 1888:—President, Dr. David Sharp, M.B., F.Z.S.; Treasurer, Mr. Edward Saunders, F.L.S.; Secretaries, Mr. Herbert Goss, F.L.S., and the Rev. Canon Fowler, M.A., F.L.S.; Librarian, Mr. Ferdinand Grut, F.L.S.; and as other Members of Council, Mr. Henry J. Elwes, F.L.S.; Sir John Lubbock, Bart., M.P., F.R.S.; Mr. Robert McLachlan, F.R.S.; Mr. P. Brooke Mason, M.R.C.S., F.L.S.; Mr. Edward Poulton, M.A., F.L.S.; Mr. Osbert Salvin, M.A., F.R.S.; Mr. Henry T. Stainton, F.R.S.; and Lord Walsingham, M.A., F.R.S.

The President delivered an Address, and a vote of thanks to him was moved by Mr. McLachlan, seconded by Mr. F. Pascoe, and carried.

A vote of thanks to the Treasurer, Secretaries, and Librarian, was moved by Mr. Kirby, seconded by Mr. C. O. Waterhouse, and carried. Mr. E. Saunders, Mr. H. Goss, Canon Fowler, and Mr. F. Grut, made some remarks in acknowledgment. Mr. Waterhouse proposed a vote of thanks to the Council, which was seconded by Mr. White, and carried.—H. GOSS, *Hon. Secretary.*

ADDITIONS TO THE BRITISH *ICHNEUMONIDÆ*.

BY EDWARD CAPRON, M.D., F.E.S.

PEZOMACHUS PILOSUS, *n. sp.*

Pitchy-black, with diffuse, longish, bristly hairs ; base of antennæ, upper surface of the thorax, and first segment of abdomen, lighter ; legs red ; aculeus barely so long as first abdominal segment.

♀. Head dull black, wider than thorax ; antennæ stoutish, thicker beyond the middle than at base and apex, joints three and four subequal, two to five yellowish-red ; prothorax entirely black ; mesothorax with upper part pitchy-red, with a blackish spot in the middle ; metathorax slightly ridged each side, in the middle smooth and somewhat excavated ; its upper part reddish, with sides and sloping part black. First abdominal segment rather long, gradually widened behind, pitchy-red, with a narrow black band just behind the projecting spiracles, which are situated between the middle and posterior third. Abdomen shining piceous-black, with diffuse, long bristly hairs, between which the surface appears very finely areolated.

Length, 5—6 mill.

A very distinct species, recognisable by its bristly hairs which also clothe the thorax.

Shiere, 1887, three examples.

CHORINÆUS TRICARINATUS, Holmg.

Holmg., Disp. method. Exoch. Scandin., p. 77, tab. II, fig. 12 ; Thoms., Deutsch. Entom. Zeits., xxxi, 1887, p, 202.

Shiere, both ♂ and ♀, 1887.

HOLOMERISTUS TENUICINCTUS, Foerst.

Foerst., Uebersicht der Plectiscoiden, p. 81.

Shiere, two ♀.

PIMPLA VARICAUDA, *n. sp.*

Black, apex of abdomen red-marked ; legs, anterior pair, reddish-yellow ; posterior, with base of femora, apex of tibiæ and tarsi, darker ; aculeus about one-sixth of abdomen.

♀. Head scarcely wider than thorax ; antennæ two-thirds length of body, black, yellow beneath ; thorax closely punctured ; metathorax with distinct areas ; abdomen almost cylindrical, 1st segment longer than the 2nd, which is slightly transverse ; 2nd to the 4th, black above, with a very narrow yellow apical edge ; 5th, reddish-ochre, with a triangular black mark in the centre ; 6th and 7th entirely red. All the segments yellow beneath ; coxæ black ; trochanters yellow with black marks.

Shiere, two ♀.

I sent this insect, as well as the *Pezomachus*, to Mr. Bridgman, who considers both of them to be undescribed.

Shiere : *February 3rd*, 1888.

DESCRIPTION OF A NEW SPECIES OF *PHYLLOTOMA*, WITH NOTE ON *NEMATUS CRASSICORNIS*, HTG.

BY P. CAMERON, F.E.S.

Phyllotoma fumipennis, *sp. n.*

Black, the abdomen above with æneous tints; the palpi, the labrum, clypeus, the inner orbits of the eyes broadly, the tegulæ, a thin line on the base of the pronotum, the trochanters, the knees broadly and the tibiæ beneath, white; the tibiæ above fuscous-black; the tarsi blackish, paler at the junction of the joints; spurs pale; wings dark fuscous throughout; antennæ as long as the abdomen, densely covered with pale pubescence, the apical joints brownish beneath; 12-jointed, the 3rd joint nearly one-half longer than the 4th. Head densely pilose; the pleuræ sparsely covered with longish white hair. Wings large, broad; the third cubital cellule dilated at the apex, as long as the first; the recurrent nervures received before the middle of the cellules. Length, 4·5 mm.

In the table given in my Mon. Brit. Phyt. Hym., i, p. 284, the above described species will come in as follows:—

5 (2) Antennæ 12—13-jointed; wings for the greater part smoky.

5*a* (5*b*) Wings uniformly fuscous; tegulæ and a narrow line on the pronotum white; legs black, the trochanters, knees and tibiæ beneath, white; abdomen æneous above .... *fumipennis.*

5*b* (5*a*) Wings smoky, hyaline at the apex; tegulæ black, legs pale yellow, black at the base; abdomen not æneous above ....*ochropoda.*

P. fumipennis is a smaller and broader species than *ochropoda*; the abdomen especially being broader and not much longer than the head and thorax united; the head between the antennæ is broader, flatter, and does not project so much, the antennæ also being more widely separated.

Taken on alder by Mr. J. B. Bridgman at Norwich.

Nematus crassicornis, Htg.

This species has never clearly been recognised by recent writers on the *Tenthredinidæ*. Thomson refers it doubtfully to his *armatus*; André, without any doubt at all; Brischke and Zaddach do not mention it; but a ♂ of the species I have described as *N. ruficornis* (Mon. Brit. Phy. Hym., ii, 62) was returned to me by Zaddach bearing the name of "*crassicornis*." There is a species in this country which agrees very well with Hartig's description of the latter, and more particularly in having the clypeus "eingebuchtet," a point in which it differs from all the other species of the *ruficornis* group, which have the clypeus distinctly transverse in both sexes. As this forms an addition to our lists of species, I give a description of it, leaving it for future research to decide whether it is really the *crassicornis*, Htg., or not. It is certainly not described by Thomson, nor, so far as I can make out, by Brischke and Zaddach.

NEMATUS CRASSICORNIS, Htg.

Blattwespen u. Holzwespen, p. 204.

Black; the apex of the coxæ, the trochanters, the base and apical three-fourths of the four anterior femora, the posterior femora at base and apex, the four anterior tarsi, the basal three-fourths of the hind tibiæ, and the tegulæ, white; the labrum brownish towards the apex. Wings hyaline, somewhat suffused with fuscous in the middle; the costa white; the stigma dark fuscous; the nervures fuscous. Head shining, shortly pilose, the front and vertex punctured, but not strongly, pentagonal area obsolete; antennal fovea small; clypeus distinctly roundly, but not very deeply, incised; apex of labrum transverse. Palpi white towards the apex. Thorax shortly, but rather densely, pilose; the mesonotum obsoletely punctured. Cenchri clear white. Abdomen longer than the head and thorax united; the anal segment and cerci reddish; the latter short, thick, about three times longer than broad. Antennæ as long as the thorax and abdomen united; moderately stout, distinctly tapering towards the apex; the third joint slightly curved beneath, and a little longer than the fourth; the flagellum black above, reddish-brown beneath. First transverse cubital nervure almost obsolete; the second cubital cellule with a horny point; the third cubital cellule about one-fourth longer than broad, dilated towards the apex. Claws with a subapical tooth. The male has the antennæ thicker, the third joint distinctly curved; the flagellum entirely red. The last segment of the abdomen above projects in the middle, this middle part being raised and separated from the sides by furrows. Length, 7 mm. ♀; ♂, 6 mm.

I have several English specimens, and Mr. Bridgman takes it at Norwich. In form and coloration it comes nearest to *N. ruficornis*, but the incurved clypeus at once separates it.

Sale, Cheshire: *January 14th*, 1888.

NOTES ON BRITISH *TORTRICES*.

BY C. G. BARRETT, F.E.S.

(*Continued from page* 36).

Ten years ago, in the course of these notes, I remarked respecting *Argyrolepia maritimana*, Wilk., "Professor Zeller assures me that this is only a large dark variety of *zephyrana*." * * * "To this opinion, in the absence of counter evidence, it seems advisable to submit."

This remark of the lamented Professor was made upon examination of the only specimen of *maritimana*, Wilk., which I was able to send him, and, until now, no counter evidence has been forthcoming.

But now Mr. W. H. Harwood, of Colchester, who has found the species in Essex, has forwarded specimens and supplied me with information which throws considerable light on the subject.

It appears that, although both forms—or species—are found in Essex, they do not occur together, the normal *zephyrana (dubrisana,* Curt.) being common on railway and other banks where wild carrot (*Daucus carota*) grows, at the end of May and beginning of June, and readily taken on the wing—as, indeed, it is elsewhere,—while *maritimana* occurs only on sand-hills, the larva feeding in the stems and roots of sea-holly (*Eryngium maritimum*), and is so sluggish that Mr. Harwood has not been able to take it on the wing, but can only rear it from the *Eryngium* stems, and that it does not emerge until the end of June or July.

In carefully comparing the two forms, I find that in *zephyrana* (*dubrisana*) the central fascia of the fore-wings is very oblique, rising on the dorsal margin near the base, and terminating in the middle of the costa. Beyond it is a second broad fascia arising near the anal angle, and parallel with the first.

Maritimana has also two fasciæ, but the first is strongly angulated in the middle, so that its extremities are opposite each other. The second is nearly straight across the wing, except that its inner margin is two or three times angulated. A still more important distinction is in the greater breadth of wing of *maritimana*, and its less oblique hind margin. It is of a deeper richer yellow than *zephyrana*, but has similar silvery lines. Its hind-wings are darker than those of *zephyrana*, but have the base *white*, with grey reticulations.

These distinctions seem to be of specific value, and I now think that *Argyrolepia maritimana* may safely be admitted as a distinct species.

Stigmonota Leplastriana, Curt.—The Rev. C. R. Digby most kindly sent me a number of larvæ of this species in shoots of wild cabbage (*Brassica oleracea*). They were in the small shoots just where they spring from the main stem, and had bored quite through the pieces of shoot when they reached me. I therefore procured from a neighbouring garden a good sized cabbage plant which had run up for blossom and had numerous side shoots. This I planted in a large flower pot and laid the pieces of wild cabbage containing the larvæ on the earth around it. Very soon, as the pieces decayed, the larvæ deserted them, climbed the plant and entered the side shoots, so that, before long, each one was tenanted, and bore evidence, in the shape of a little heap of frass protruding from a hole close to the joint, that the inmate was satisfactorily employed. The larvæ fed on the pith of the side shoots, eating them out so completely that they withered, but did not enter the main stem. They were cylindrical, rather plump, shining pale glaucous or almost yellowish-white, with darker dorsal vessel. Head deep shining black, dorsal plate blackish-brown, anal plate pale brown, feet pale greenish, spots not observable. When full-fed they descended to the earth to spin up, and were easily reared.

Catoptria candidulana, Nolck. — I found larvæ in plenty in September, 1886, on *Artemisia maritima* growing in salt marshes. They bore a curious resemblance to those of some of the *Homœosomæ*, and were plump, much wrinkled, each segment being divided transversely by a fold of skin, marking off the hinder third of the segment. Colour dull whitish with narrow dorsal line, and broad sub-dorsal stripes of a dull purplish, interrupted at every division and fold by the ground colour. Spots large, whitish ; head shining brown ; dorsal plate large, broadly whitish in front, shading off to brown behind, but with a white line down the centre. Anal plate and legs mottled with brown and white, prolegs white. When young the head and plates are black. Rather sluggish, living among the flowers of *Artemisia maritima*, uniting them together with a silken tube which runs up the spike, and eating out the flowers and young seeds. Greatly preferring the ordinary dense, upright spikes, but occasionly found on the lax, spreading variety of the plant, in which case it moves about from one lateral spike to another, making a small covering web on each. When full-fed it leaves the plant and spins up up among *débris* or in the mud, of which it must have an exceedingly damp experience for the nine or ten months which elapse before it enters the pupa state.

King's Lynn, Norfolk :
November 19*th*, 1887.

CONTRIBUTION TO THE LIFE-HISTORY OF *NEPHOPTERYX ABIETELLA*, S. V., WITH A DESCRIPTION OF ITS LARVA.

BY EDWARD A. ATMORE, F.E.S.

From time to time during the last few years I have casually met with the imagines of *Nephopteryx abietella*, and late in April, 1885, whilst searching for pupæ of *Retinia turionana* in the shoots of small Scotch fir trees, I made my first acquaintance with its larva. On that occasion a single full-grown larva was found, feeding much like that of *turionana* does earlier in the year, viz., in a central shoot, and causing an abundant exudation of resinous matter. I did not examine this larva very carefully, so that from its superficial resemblance to that of the *Tortrix*, both in point of colour and its mode of feeding, it was placed in a jar with the pupæ of *R. turionana*. At the end of June I was pleased to find that a beautiful specimen of the Phycid had emerged, doubtless resulting from the larva to which I have briefly alluded.

From this time I became desirous of renewing my acquaintance with the habits of *N. abietella* in the larval state, and accordingly, on the 23rd of April of the following year (1886), a visit was made to a locality in which I had occasionally taken an imago. Here, after a vigorous, though I confess for a long time unsuccessful, search, two larvæ of large size were found, feeding in central and terminal shoots. After much time had been spent in a vain endeavour to find others, it occurred to me that this larva might probably have more than one method of feeding. Acting upon the impulse of the moment, the search was resumed, this time I am glad to be able to say, with more success. On some trees, dead shoots of the previous year's growth, varying from two to four inches or more in length, were detected. A subsequent examination of one of these plainly indicated that, at some time or other, it must have been tenanted by a larva. Following up the clue thus obtained, several of these withered stems or shoots were collected, and in one of them a larva of *N. abietella* was fortunately discovered. Continuing the search I had the satisfaction of returning home with a total of fifteen larvæ. Of these I note that two only were found feeding in the young sprouting shoots; one, which must have nearly attained its full growth, had betaken itself to a small cone, then only in process of formation, and about the size of a small hazel nut, and which, by the way, it had reduced to a mere shell, the protruding frass from a small hole near the base betraying its presence. All the others, twelve in number, and varying in size from comparatively small to the nearly full-grown larva, were found burrowing in shoots of the previous year, eating out the pith. It would seem, therefore, that although the larvæ may occasionally feed in the young shoots or very young cones, they are far more generally to be found in the one year old shoots. I obtained one larva from a tree not more than three feet high, but the majority of them were obtained from lateral branches of trees varying from ten to fifteen feet high, and here I would observe that outlying or detached trees yield the best results. The stem or shoot which contains or has contained a larva may be known by its decayed or sickly appearance, the terminal shoots showing a decided absence of vitality, and the acicular leaves (or needles, as they are more generally known) being shrivelled and brown. The mine or burrow is from one and a half to three or more inches long, contains a quantity of frass, and is terminated at each end by a round hole for exit, and these holes are usually situated on opposite sides of the shoot. If the burrow contains a larva, frass of a pale reddish-brown colour is seen to be protruding from the lower hole. When the larva is of large size, it is by no means uncommon to find two or three mines of different length immediately succeeding each other on the same stem, in which case the largest one, and that which is furthest from the apex of the stem or shoot, will contain the larva.

A Coleopteron (*Hylurgus piniperda*) also mines the one year old shoots of Scotch fir, and, judging from injuries committed by it, is far too common in this district. Its mine or burrow is scarcely ever more than two inches, and often not more than an inch or inch and a half long, and there is but one hole for exit, which is situated at the base of the burrow. Moreover, around the hole a quantity of a yellowish resinous substance is to be noticed. This resinous exudation is never observable near the holes caused by the larva of the Phycid, so that the eye soon becomes accustomed to distinguish between the working of the Coleopteron and of the Lepidopteron.

DESCRIPTION OF THE LARVA.—The full-grown larva is active, and of about five-eighths of an inch in length; cylindrical, but tapering slightly behind. Dull greyish or dull greyish-white, with the narrow dorsal and broad sub-dorsal lines dark smoky-grey; spots similar, with abundant hairs. Intestinal canal dark green, giving a greenish tinge to the body. Head shining dark brownish-black; thoracic plate dark brown, usually grey towards its anterior edge. Anal plate, ventral surface, and legs, horn colour.

Burrowing in a last year's shoot of *Pinus sylvestris* (Scotch fir), eating out the pith, and partially filling the passage with frass, but having a round hole for exit at each end of the tunnel. Occasionally feeding in young sprouting shoots, or in a *very small* cone. Pupates probably in a cocoon beneath moss or rubbish, and emerges between the end of June and the middle of August.

Most of my larvæ appeared to be still feeding about the middle of May, when, in consequence of protracted illness, I was unable to give them further attention, so that all (with the exception of three which had successfully pupated, and producing moths on the 22nd, 23rd, and 28th July) died as larvæ, probably from the stems becoming too dry. This year I again looked for larvæ of this species at the end of April and beginning of May, but could find only two shoots containing them. I think they must have fed up earlier than in the preceding year, for several empty shoots were noticed, which bore every indication of having but recently contained larvæ. Of the two larvæ found last spring, one died from some unknown cause shortly after it came into my possession, and the other was unfortunately the victim of a parasite. I am therefore unable to state with certainty how the larva pupates; but there can be little doubt that it leaves the shoot to spin a cocoon between moss, or *débris*, and the soil.

M. Ragonot (*vide* Ent. Mo. Mag , vol. xxii, p. 52), under the title of *Nephopteryx abietella*, S. V., describes both imago and larva of two closely allied species attached to Scotch fir, viz., *N. decuriella*, Hb., = *abietella* (S. V.), Zincken, and *N. sylvestrella* of Ratzeburg. The latter species has not been noticed to occur in England; but the description he gives of the larva of *N. decuriella* (*abietella*) does not agree with that of our insect. Assuming, therefore, M. Ragonot's description to be correct, that of the present notice suggests the probable existence of another or third species.

King's Lynn, Norfolk :
December 31*st*, 1887.

Note on Dioryctria decuriella and its allies.—In rely to your query respecting a species of *Dioryctria* bred from a larva found feeding on *Pinus sylvestris* by Mr. Atmore, I beg to say that *decuriella*, Hb. (*abietella*, S. V.), feeds both on firs and pines; as mentioned in my " Revision," the larva is reddish-brown and lives in the cones, young shoots, and decayed wood of the *Coniferæ*; the absence of the reddish-brown patch before the first line and, no doubt, the smaller size of Mr. Atmore's insect, proves that it must be referred to *decuriella*, Hb. The life-history of the other species which feeds on fir has been given at length by Duponchel (Ann. Soc. Ent. France, 1832, p. 300, pl. x), under the name of *decuriella*, Hb. I have read again with care Ratzeburg's descriptions and find they are very ambiguous. He seems to have felt that there were two species under the name of *abietella*, but he could not find sufficient characters to separate them. His observations on the larvæ prove that he had no clear idea of the differences in colour and mode of living, for he states that the larva of his *sylvestrella* is reddish-brown, closely resembling that of *abietella*, and feeds in the cones, but adding that, according to Fintelmann, some larvæ are of a dirty pale green, and that Fintelmann found the larvæ feeding in exudations of resin on firs. This being the case, I am now of opinion that it is better to adopt for the species whose greenish larva feeds in the resin, or, at least, induces the resin to run by its ravages in the trunks of firs, the name of *splendidella*, given by Herrich-Schäffer; for this author has very well figured the insect (Tin., pl. 7, fig. 43), and in his description, page 79, he separates *splendidella* from *abietella*, giving *splendidella* as a peculiar form of *abietella*, S. V. The name of *splendidella*, Mann, was a manuscript name, and applied, in reality, to *pinguis*, Hw.; however, it is likely that Mann sent Herrich-Schäffer, under this name, both the *Dioryctria* and *Euzophera*, as both are represented on plate 7 as *splendidella* (fig. 43 and 44), but the *Dioryctria*, having first been described and figured, must bear the name of *splendidella*, of which it is well worthy with its *silvery*-grey wings with black markings, varied with reddish-brown, and its large size. The North American *Pinipestis reniculella*, Grote, and *P. abietivorella*, Grote, I consider only dark forms of *decuriella*, Hb., and, of course, the generic name of *Pinipestis*, Grote, is simply synonymous with *Dioryctria*, Z.—E. L. Ragonot, 12, Quai de la Rapée, Paris: *February* 11*th*, 1888.

LARVÆ OF *LEPIDOPTERA* FEEDING ON *COCCIDÆ.*

BY J. W. DOUGLAS, F.E.S.

The "Bulletin des Séances de la Société Entomologique de France," 25th August, 1886, p. 234, contains a Note by M. Peragallo, of Nice, on the coccophagous habits of the larva of *Erastria scitula*, Hübn., which is designated "une chenille utile à l'agriculture." This Note has been deemed of sufficient interest to be translated into German, and it appears as an article in the part of the "Stettiner entomologische Zeitung" just published (48 Jahrg., p. 274).

The narrative of M. Peragallo shows that under some conglomerated scales of *Ceroplastes rusci* on branches of a fig tree, covered by a peculiar pergameneous web, was a larva (or pupa), which M. Millière recognised as that of *Erastria scitula*, Hübn., and he has described it in the "Revue d'Entomologie," 1884. From the shelter-places formed by the scales he collected these *Erastria* larvæ in the winter, not only on the figs, but also on oleanders and Yuccas attacked by Coccids of different kinds having firm shells, and he obtained the moths in May. On the 1st July, when clearing away the numerous black shells of *Lecanium* from the lower leaves of a Yucca growing in his garden at Nice, he observed in the midst of the Coccids some cots of all sizes of *Erastria*, the inhabitants of which (of all ages) moved about each with a shell on its back. Having watched them, more particularly those not larger than the head of a pin, he arrived at the following conclusion. The females of *Erastria* disclosed in May couple, and then lay their eggs in the midst of the female Coccids, which at that time are full of yellowish-salmon-coloured eggs. The little larva when hatched enters a shell, and soon empties it; when the young larva does not find enough nourishment in the shell it leaves it, and, still keeping the shell on its back, seeks a second, and plunges its head into the new victim; and when it has emptied this, like the first, it takes the shell on its back and welds it to the first.* When the larva is full-fed, and has constructed for itself a carapace composed of at least four shells, which had contained 1000 or 1200 eggs, it fastens itself, in order to undergo its transformation, to a branch or leaf, or in a crevice of the bark, and often, in company with others of its species, towards the base, isolating itself by means of a pergameneous web adhering to the leaf or branch.

It is certain that *Erastria scitula* feeds exclusively on the eggs contained in the firm shell of *Ceroplastes* and *Lecanium*; that it uses the empty shells to form a portable shelter in which to undergo its transformation; and, finally, that there are two broods in a year.

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* In a similar manner the larvæ of *Hemerobii* disguise themselves with the skins of their Aphidian victims.—J. W. D.

Millière (*op. cit.*, Tome iii, p. i, pl. i) describes the larva, which, he says, the naturalist, Hemmighofen, of Barcelona, was the first to discover, and to whom is due the knowledge of the early stages of this moth; but it is to M. Peragallo we owe the exact perception of the very interesting habits of the larva, which were previously unknown. The figures show the moth, and larvæ *in situ* on a branch, each with its covering of the empty shells of a *Lecanium*, which bears some resemblance to the carapace of a small tortoise. M. Millière adds that, although the larva has a very remarkable form, it is not unique among the *Noctuidæ*, for he has figured in his "Iconographie," iii, pl. 139, No. 4, the larva of *Thalpochares communimacula*, which has the same abnormal form, and has, doubtless, the same habits as that of *E. scitula.* He suggests that the two species should be separated from *Thalpochares*, and form a distinct genus. The genus *Thalpochares* was instituted by Lederer in the "Verhandl. z.-b. Verein," as he states in his "Noctuinen Europa's," p. 185 (1857), in lieu of *Anthophila* and *Micra*, both names being pre-occupied; and he places in his genus seven species, including *communimacula*, S.V. Of this he says he had no particular knowledge, but that the larva lives in a web, and is associated with a species of red Coccid, which is attached to sloe, whitethorn, and peach-trees. *Scitula*, which he says is common in Germany, he left, with seven other species, in the genus *Erastria*, Hübn., saying nothing about the food of the larva, beyond the general remark that, with two exceptions, *all* of them feed on grasses, which is certainly incorrect, for that of *E. venustula* feeds on the flowers of *Potentilla reptans* and *P. tormentilla*, and brambles (*Rubus*).

The purpose to be served by the covering of empty shells on the larvæ is not suggested by either author, but there can be no doubt that it effects a protection from enemies that would otherwise attack the larvæ and not the Coccids. We have not yet found in Britain either the *Erastria* or the elegant, white, octagonal shells of *Ceroplastes*, but we have on many woodland and fruit trees several other species of *Lecanidæ*, which, although doubtless they do some harm by the abstraction of the sap, on which they live, yet do no appreciable mischief, probably because in this climate they are not sufficiently numerous, and *Erastria* or other predaceous Lepidopterous insect would not thrive on the short allowance it would find. I ought, perhaps, to except *Lecanium ribis*, A. Fitch, which clusters in great quantities on the branches of currant bushes, and, I am informed, sometimes plays havoc even to the destruction of the bushes. Another Coccid, *Mytilaspis pomorum*, Bouché, often abounds on the stems of apple and other fruit trees, especially if from any cause the tree be sickly, to that extent that the tree dies. Although the scales are comparatively small, and the inhabitants are kept in check by parasitic *Hymenoptera* and *Acari*, there is yet room for the aid of Lepidopterous or other beneficent agents, though it may be doubted if the owners of the trees would recognise them in this capacity.

There are other and previous records of the destruction of Coccids by Lepidopterous larvæ. In the "Report of the Entomologist of the United States Department of Agriculture for 1879," by Professor J. H. Comstock, several such coccophagous larvæ are enumerated; the descriptions of them and the resulting moths are too long to give in this *résumé*, but I cite the salient points of the economy of the respective species.

Dakruma coccidivora, Comst. (Fam. *Pyralidæ*).

In a colony of scales of *Pulvinaria innumerabilis*, Rathvon,* was found a larva of this Pyralid, living within the cottony mass excreted by one of the Coccids. Other scales were found to be similarly tenanted, and the eggs that had been laid, or the young Coccids that had been developed from them, had been destroyed. Although the larva is well protected, living as it does within the mass of cottony excretion, it spins about its body a delicate silken tube. When a branch is thickly infested by the *Pulvinaria*, these tubes extend from one shell to another; the caterpillars moving freely about within these silken passages. The cocoon is made within the tubes, the pupa being plainly visible through the texture. The moth emerges within a month or six weeks. More than forty moths were bred, and there was no indication of the larvæ having fed on the tree on which the scales were found, nor any evidence that they had eaten any of the excretory masses in which they live. These predaceous larvæ were so numerous that it was difficult to find a scale not infested by them, and the efficiency of the check to the spread of the *Pulvinaria* is seen in the fact that the scales have not as yet become commonly distributed in Washington. The same moth was also bred from other Coccids received from Florida,—a *Lecanium*, a *Dactylopius*, and *Lecanium hesperidum*, showing that it is widely distributed and always predaceous.

Dakruma pallida, Comst.

The larvæ of this species were found living within a spherical gall-like *Kermes*, on oak near Sanford, Fla., and other specimens were found feeding on the eggs of another species of *Kermes* at Fort George, Fla. When full-fed, the larva leaves the Coccid and makes a cocoon, which is attached to the outside of the Coccid, or to a neighbouring twig.

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* Figured in Comstock's "Report" for 1880, pl. 11, fig. 6. The species is probably synonymous with the *P. vitis*, Linn., of Europe; in America it lives on maple, negundo, grape, Osage orange, and other plants, often in such numbers as to be a pest.—J. W. D.

Blastobasis coccivorella, Chambers, n. sp. (Fam. *Tineidæ*).

The larvæ feed inside the scales of an undescribed *Kermes*, allied to *K. pallidus*, Réaum. Many specimens of the *Kermes* were found on oak at Cedar Keys, Fla., and on March 15th, the larvæ of the moth commenced to pupate. A round hole was first cut through the scale, which had hitherto been intact, and a comparatively compact cocoon was spun outside, attached to the edges of the hole. Moths appeared on the 1st and 10th April.

Euclemensia Bassettella, Clemens (Fam. *Tineidæ*).

From the large gall-like *Kermes* found on oak at Cedar Keys was also bred a beautiful greenish-black moth, with its fore-wings marked with reddish-orange. This was first described by Clemens (Proc. Ent. Soc. Phil., ii, p. 423),* under the name of *Hamadryas Bassettella*, after Mr. Bassett, in Connecticut, who had stated that he had bred it from a gall; but Prof. Riley pointed out that the supposed oak-gall was really a Coccid.

I wonder if there are not more instances in which "galls" have been reported to have yielded *Lepidoptera*, and these have really been produced from the shells of Coccids, often so like true galls that in France they are called "*Gallinsectes*." Collectors will, perhaps, make a note.

In "Nature," December 30th, 1886, p. 215, is a notice of the papers read at the meeting of the Linnean Society of New South Wales, on October 27th previous, as follows:—

"Descriptions of new *Lepidoptera*, by E. Meyrick, B.A., F.E.S. In this paper descriptions are given of sixteen new species of Australian *Lepidoptera*, belonging to fourteen genera, of which six are new. Among them is *Thalpochares coccophaga*, of which, at the December meeting, Mr. Masters exhibited specimens of both moths and larvæ, and called attention to the singular habits of the latter, which feed on a species of *Coccus* infesting a *Macrosamia*, living concealed in a cocoon-like shelter, formed of the exuviæ of the *Coccus*, and finally pupating therein."

It thus appears that in Europe, N. America, and Australia, there are *Lepidoptera* of different Families, whose larvæ are exclusively coccophagous, and it cannot be doubted that more are yet unknown. In other regions where *Coccidæ* abound, there is also a wide field for investigation: possibly resulting in the discovery of new species, or the identification of the larvæ of some already known only in the perfect state. Whether or not man may be able to utilize the devourers of Coccids to *his* purpose remains to be tried; the idea seems feasible.

8, Beaufort Gardens, Lewisham:
November 26th, 1887.

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* See also "The Tineina of North America, by Dr. B. Clemens, with Notes by the Editor H. T. Stainton." London, 1872.—J. W. D.

INFORMATION WANTED AS TO *SELENIA ILLUNARIA*, &c.

BY F. MERRIFIELD, F.E.S.

In connection with some systematic experiments I am trying with *Selenia illunaria* (*bilunaria*) and *illustraria* (*tetralunaria*), I should be greatly obliged by information derived from personal knowledge, or from trustworthy authorities, as to the distribution, time of appearance, size, colour, and habits of these insects in different parts of Europe, or of the British Isles, and should be grateful for fertile eggs of typical specimens taken wild anywhere else than in the South of England. There seems no doubt that both species are generally double-brooded in the centre and south of Europe, and single-brooded in the north ; and that where there is but one brood, it resembles in size and markings the first or spring emergence in those places where the insects are double-brooded. I will make any return in my power, and can promise in the spring fertile eggs of both species from healthy south of England examples. Guenée gives what appears rather strange times of appearance for *illunaria*, which he describes as occurring throughout Europe in March, April, and May, and then in *September* and *October*. In the south of England, I believe, the second brood appears in *July*, as stated in Mr. Stainton's Manual, but extending into August. There is another matter on which these two authorities appear to differ. Mr. Stainton, speaking of *illustraria* in its winged state, says that the summer or August brood is more plentiful than the larger specimens of May. M. Guenée, speaking of the caterpillars of the genus *Selenia*, writes as follows: "These caterpillars live exclusively on trees, and have in general two generations: the first and most numerous, which is disclosed in autumn, appears as a moth in the April or May following ; the second, which is, so to speak, exceptional, though destined to ensure the autumnal reproduction, gives in general but a small number of individuals. These circumstances, which, by the way, are common to many other *Lepidoptera*, demand here particular attention, because they touch on a question of variation among *Lepidoptera* which is not yet entirely solved, and requires to be further investigated." There is a further point on which I shall be glad of information, and it relates to the third European species of the genus, viz., *S. lunaria*, and that is as to the position of its wings at rest, whether it resembles that of the wings of *illunaria*, which meet over the back like those of a butterfly, or is more like the position of *illustraria*, which rests with the wings recurved, but widely separated. May I suggest to those of your readers who may meet with any of the *Selenias* in the approaching spring kindly to make known the result of their observation on any of the points I have adverted to, all of which it is desirable on several accounts to clear up.

24, Vernon Terrace, Brighton:
February, 1888.

Notes on the larva of Olindia ulmana, Hb.—Until the present month, the only reference I have ever seen to the larva of this species was in Frey's "Lepidoptera der Schweiz," p. 295. He there states that it feeds on *Aquilegia vulgaris, spinning the leaves up*. That this, however, could not be the only food plant was evident from the fact, that the imago has been frequently taken where the plant was quite absent. Still Prof. Frey is invariably so accurate in his statements, that I have no doubt the above record is true, and that *Aquilegia vulgaris* is *one* of the food plants. Mr. F. Bond tells me that he suspected *Lythrum salicaria*, also a low growing plant. On the other hand, the majority of Micro-Lepidopterists, from its name, have always associated the insect with elm; and Mr. Atmore once beat the imagos in some plenty from an elm hedge in Norfolk. I have, however, now to thank Mr. W. H. B. Fletcher of Worthing for drawing my attention to a far earlier and more circumstantial record than that of Frey.

In the "Annales de la Société Entomologique de Belgique," vol. vii, 1863, p. 43, Dr. Breyer gives *Ranunculus ficaria* as another food plant, with a succinct account of the larva's habits. It is strange, indeed, that this notice should have escaped observation, both in England and on the continent, for *nearly a quarter of a century!*

Dr. Breyer's note runs as follows:—"This pretty *Tortrix*, of which fresh examples are so rarely seen in collections, is widely distributed, without being anywhere common. Hitherto the larva has remained entirely unknown. For three years I have been on the track, but only this season have I been lucky enough to rear the species. The larva is found in early spring on the leaves of *Ranunculus ficaria*. It folds a piece of the edge of the leaf down on the under-side, so as to form a cylindrical tube, which serves as a shelter, and gnaws the leaf in the neighbourhood of its dwelling. In order to rear the species, the food plant should be potted, it would not feed on faded leaves or leaves kept in water, and the pot should be covered with a bell glass or a lid which is airtight, or the larvæ will escape. Pupation takes place in a cocoon on the ground, the imago emerging during the second half of May. The period during which the insect is out is very short; by the end of a fortnight the species is worn."

Dr. Breyer promised to give a full description with plate of the larva in the next year's volume, but I can find no further mention or notice of either.—W. Warren, Merton Cottage, Cambridge: *February 9th*, 1888.

[The food plant here given accords well with the only locality in which I ever met with *Olindia ulmana*. It was whilst searching for *Halonota turbidana* amongst its food plant (*Tussilago petasites*) on the banks of a small tributary of the Teign, at Chudleigh, in Devonshire, on the 13th and 14th June, 1850, that I obtained my specimens of *O. ulmana.* I can readily conceive that in early spring the ground there is yellow over with the flowers of *Ranunculus ficaria.*—H. T. S.]

Habit of Nemotois fasciellus.—Last April I received from the late Mr. W. Farren half-a-dozen larvæ of this species; he had found them feeding on *Ballota nigra*, near Cambridge. Mr. Farren, having collected a number of these larvæ, put a plant of *Ballota* in a large flower pot, and on top of the soil he placed a quantity of dry fibrous rubbish, from one and a half to two inches in depth; he then plunged the pot in the garden, turned the larvæ on to it, and tied a piece of coarse muslin over all; lest they should suffer from excess of wet he fixed a piece of glass above the top of the plant to keep out most of the rain. The larvæ fed up well under this treatment, and when their time for pupation arrived, they burrowed right through the fibrous rubbish down into the solid earth and there fixed their cases, end up, just below the surface of the earth. Afterwards, on taking the cases out, Mr. Farren found they were anchored by a silken thread to any little pieces of fibre which were handy. He also noticed that the antennal cases, which are very long, are detached and loose from the body of the pupa. From 46 larvæ he bred 43 moths, so that these larvæ were certainly unusually free from parasites. Whether that is the general characteristic of the species is, however, a matter for further observation. The foregoing notes were kindly furnished to me by Miss Farren during her father's last illness.—H. T. STAINTON, Mountsfield, Lewisham: *February 1st*, 1888.

The Coleophora of the Potentilla, which was originally found in St. Leonard's Forest, Horsham, by Mr. W. C. Boyd several years ago.—This insect has been so long known under the manuscript name of *Coleophora potentillæ* of Boyd, that it seems quite time it should have the pleasure of seeing its name in type.

Allied to *C. paripennella* and *ahenella* (noticed Ent. Mo. Mag., xvi, 165), *C. potentillæ* is smaller than either; the expansion of the wings varying from 4—4½ lines, whereas the exp. al. of *paripennella* is 5 lines and that of *ahenella* rather more.

The anterior wings are more slender than in either of the two above-named species, and are bronzy-green or bronzy-grey; whereas, those of *paripennella* are brownish-bronze, and *ahenella* only differs in colour from that species by being a little darker. The antennæ of *potentillæ* are sharply annulated throughout their length (in this respect resembling *ahenella* and very different from *paripennella*), with only the first two basal joints entirely dark and slightly thickened.

The larva of *potentillæ* is an autumnal feeder, allied in habit to *paripennella*, and, like that insect, feeding indifferently on several plants. Mr. Boyd has an idea that it sits flatter on the leaf than the larva of *paripennella*, though I am scarcely able to conceive how that can be possible; the case much resembles in structure that of *paripennella*, but is, I believe, always paler.

After the insect had been found in St. Leonard's Forest, Horsham, by Mr. Boyd, Mr. W. H. B. Fletcher met with it on the Downs near Arundel, Steyning and Worthing, feeding on bramble, raspberry, rose, *Spiræa filipendula* and *Poterium sanguisorba*, as well as on *Potentilla tormentilla.*

Mr. Fletcher finds that in captivity the larvæ eat readily the leaves of strawberry. Mr. Elisha has, I believe, met with the insect in Epping Forest.—ID.

Cæcilius atricornis, McL., in Arundel Park.—I was fortunate enough to take five specimens of *Cæcilius atricornis*, McL., by beating laurel, hawthorn, &c.; no doubt many more might have been taken had time permitted, as the *Psocid* was not confined to a limited area, but occurred at various points around the lake. I do not think that *C. atricornis* has been taken by beating before, the previous records mentioning that the specimens were obtained among rubbish in dry ditches.—J. J. F. X. King, Glasgow: *January*, 1888.

Quedius longicornis, Kr.—A short while ago I found among my *Quedii* a specimen of this very rare species. I captured it under the trunk of a tree lying on the ground in Bretby Wood, near Burton-on-Trent, while searching for *Boletobius inclinans*, which occurred very sparingly in the same locality. Mr. Blatch has taken the species in Buddon Wood, Leicestershire, but I know of no other record from England. It has been taken very rarely in the Solway District of Scotland by Dr. Sharp.—W. W. Fowler, Lincoln: *January 10th*, 1888.

The Entomology of Gibraltar.—I am still working fairly hard at the entomology of this most interesting locality, with, on the whole, very good success, at any rate in *Coleoptera*, in which I have increased my local list to nearly 1100 species. We had a great deal of rain just after Christmas (12 inches in 7 days!), so there was a vast accumulation of flood refuse about the streams, most productive in beetles; indeed now, after a fortnight's fine weather, it still repays examination. Perhaps my most interesting capture has been the little ants' nest "*Hister*," lately described by Mr. Lewis (*ante* p. 164) as *Hetærius acutangulus*, of which I have lately found two examples in this neighbourhood. I went for a short walk on the lower slopes of the Rock this afternoon, and saw ten species of butterflies on the wing. *Colias Edusa* was plentiful, and some of the specimens were so newly emerged that they could scarcely fly. *Euchloë Belemia* is out, but this I saw more than a month ago at Tangier. I have been devoting a little attention to the ants lately, at Mr. Saunders' suggestion.—J. J. Walker, H.M.S. "Grappler," Gibraltar: *Jan. 27th*, 1888.

Dicerca prolongata, Le Conte.—Early in December, while I was chopping up an aspen tree (*Populus tremuloïdes*, Michx.) here, I came across the remains of a beetle, belonging to the *Buprestidæ*, in the burrows of some larvæ which had evidently destroyed the life of the tree. I sent this to the Agricultural Department at Washington, and am informed that the species is *Dicerca prolongata*, a beetle previously recorded for Colorado by Packard (Bull. 7, U. S. Ent. Com.), but supposed by him to be a pine feeder, though, he adds, his specimen was found on a poplar tree. Not long after, I found one of the burrows in another *P. tremuloïdes* tree tenanted by a Coleopterous larva, which I have no doubt is that of *D. prolongata*, from its great resemblance to the figure of the larva of *Dicerca divaricata*, Say, as figured in 3rd Rept. U. S. Ent. Com., pl. vi, fig. 2. *D. divaricata* has long been known as injurious to cherry and peach trees, and it is therefore interesting to find a species in Colorado destroying the poplar. In places where the trees were valued it might be considered a decidedly injurious insect, but I find it rather beneficial than otherwise myself, since the dead trees supply me with firewood, a thing not to be despised with the temperature often below zero. So far as I have observed, *P. tremuloïdes* is less susceptible to the attacks of leaf-insects than the *P. tremula* of Europe.—T. D. A. Cockerell, West Cliff, Custer Co., Colorado: *Jan. 6th*, 1888.

Captures of Coleoptera in the Hastings district.—The following captures of *Coleoptera* in the Hastings district, during the months of November, December, and January, may be of interest. *Ilyobates nigricollis* (1), in a *Boletus*; *Staphylinus stercorarius*, running across a pathway; *Lathrobium longulum*, *Anchomenus oblongus*, and *Cephennium thoracicum*, in *Sphagnum*; *Helops cœruleus* (1), *Endomychus coccineus* (13), *Tetratoma fungorum* (5), *Platynaspis villosa* (2), *Rhinosimus viridipennis*, and *Pogonocherus hispidus* (1), under loose bark; *Ennearthron affine* and *cornutum*, *Engis rufifrons* and *humeralis*, *Cryptophagus scanicus*, *Triphyllus punctatus*, *Cis bidentatus*, and *Homalium cœsum*, in fungi. At Fairlight I took a specimen of *Coryphium angusticolle* from an old bird's nest, and found another under bark near Ore. *Corticaria crenulata* and *curta* were in the greatest profusion at the roots of *Glaucium* at Bo Peep; but I looked in vain for *Syncalypta hirsuta*. *Elmis æneus* was common at Guestling and Ecclesbourne, and at the former locality I took a single specimen of *E. Volkmari*. The only other things worth mentioning were *Opilus mollis*, *Scymnus limbatus*, *Hylesinus crenatus*, *Orchestes alni*, and *Tychius meliloti*.

Among some *Coleoptera* taken some years ago, the Rev. W. W. Fowler has kindly named the following, not previously recorded from this district:—*Epuræa florea*, *Rhizophagus parallelocollis*, *Colon latum*, and *Cis alni*.—W. H. Bennett, 11, George Street, Hastings: *February*, 1888.

Review.

The Butterflies of North America: by W. H. Edwards. 3rd Series, Parts III and IV. Boston and New York: Houghton, Mifflin & Co. London: Trübner & Co. 1887.

Three out of the six magnificent plates in these two parts are devoted to species of *Argynnis*, one to *Melitæa*, one to *Colias*, and one to *Cœnonympha*. All are of the usual excellency, the species of the last named genus has over forty separate figures allotted to it, representing variation, transformations, details of structure, &c. The text shows that no pains have been spared in acquiring the fullest and latest information from all points of view.

Obituary.

George Robert Waterhouse was born at Somers Town, on March 6th, 1810. He commenced his career as an Architect, for which profession he had been educated, devoting his spare time to the study of Natural History, some articles in the "Penny Cyclopedia" on Fishes and Insects being among his earliest writings. In 1833 the Entomological Society of London was founded, with Mr. Waterhouse as its first Curator, and with his decease, that Society loses the last of those who were present at its first meeting, although four of the original members still remain. In 1835 he accepted the appointment of Curator to the Museum of the Royal Institute at Liverpool, which he, in a little more than a year, exchanged for the Curatorship to the Zoological Society of London. By the spring of the next year he had prepared a Catalogue of the Mammals in the Museum. This, however, was not published until 1838, owing to his having introduced his own classification, which was strongly opposed by some members of the Museum Committee. About this time he wrote the volume on Marsupials in Sir W. Jardine's "Naturalist's Library," and also the account of the Mammals collected by C. Darwin during the voyage of H. M. S. "Beagle," as well as several papers on the *Coleoptera* collected during the same voyage, including an account of those of the Galapagos Islands. In 1843 (Nov.) he was appointed an Assistant in the Geological Department in the British Museum, and in 1844 commenced his work on the "Natural History of Mammalia," which occupied all his available spare time until the completion of the 2nd volume, in 1848, when the publisher was unable to continue his work. He was President of the Entomological Society in 1849 and 1850, and in this latter year he was elected an Honorary Fellow of the Zoological Society. In 1851 (Dec.) he succeeded Mr. König as "Keeper of the Mineralogical branch of the Natural History Department" in the British Museum, the geological collections being at that time associated with the minerals. In 1855 he prepared an article on the Geographical Distribution of the Rodents for Keith Johnston's Physical Atlas. In 1858 he visited Germany to examine a collection of fossils offered for sale to the Trustees of the British Museum. In it was the famous *Archæopteryx.* In this year, and until 1861, he was engaged in the preparation of his "Catalogue of British Coleoptera," which gave such an impetus to the study of this Order of Insects among British Entomologists, and which was especially valuable in consequence of the clearing up of the synonymy of many species described by J. F. Stephens, hitherto resting uncertain. Mr. Waterhouse was Vice-President of the Zoological Society in 1862—3. Besides the separate works already alluded to, the Royal Society's Catalogue of Scientific Papers enumerates 117 of which he was the author. He was an excellent draughtsman : many of his papers were illustrated by himself. Latterly he occupied himself with literary researches, and in his official capacity was much engaged in the preparation for the removal to South Kensington of the Geological Collections, which, since 1857, had been separated from the Minerals. By his advice, which his early training as an Architect qualified him to give, the basement and ground floors of the right wing of the New Museum were considerably modified so as to increase the accommodation for the Collections. This work harassed him much, and feeling unequal to the anxiety consequent on the approaching removal, he resigned his appointment in 1880. In 1885 he had a paralytic stroke, from which he never entirely recovered ; and he died January 21st, 1888, in his 78th year. Of his three sons, the eldest is the well-known Assistant in the British Museum, who promises to eclipse his father's fame as a Coleopterist ; the second is the Librarian to the Zoological Society ; the youngest was for some time Entomological Curator to the present Marquis of Ripon. His second daughter is the widow of Mr. E. C. Rye, one of the founders of this Magazine, whose untimely decease his colleagues remain to deplore. A taste for Natural History pursuits appears to have existed in his family, for one of his brothers (still living) was for many years Curator of the Museum at Adelaide, South Australia. Two traits were especially prominent in Mr. Waterhouse's character : a nervous striving at scientific accuracy in all his writings ; and an amiability, even under the most trying circumstances, that endeared him to all his friends.

Dr. John Thomas Boswell, F.L.S. (formerly known as Dr. Boswell Syme), died at Balmuto, Fifeshire, on January 31st, aged 66. He was born at Edinburgh, and educated as a Civil Engineer, and, for a time, followed his profession. But his name will always be associated with the second edition of "Sowerby's English Botany," which he brought to a successful conclusion. For a time he was Lecturer on Botany at the Charing Cross and Middlesex Hospitals. Practically a Botanist, he took an interest in Entomology also, and formed a fine collection of British *Lepidoptera*, but as an Entomologist he is perhaps almost forgotten by the present generation. He was especially fortunate in his treatment of the larger *Sphingidæ*, especially *Deilephila galii*, and a chronological account of his experiences with regard to this insect appeared in Vol. ii of this Magazine (1865), but outside botanical subjects he wrote little, and his habits were essentially quiet and retiring. On the death of a relative some 20 years ago, he succeeded to the estate at Balmuto (and dropped the name of "Syme"), where his family is said to have existed continuously since the 14th century.

William Farren, of 14, King's Parade, Cambridge, died on the 21st November, 1887, at the age of 51. He was one of the early Members of the Cambridge Entomological Society, where, as far back as 1857, he exhibited *Micro-Lepidoptera* captured by him in Kent; he afterwards made various collecting expeditions to Wicken Fen, to Suffolk, and to the New Forest, and where, in 1861, he resided five months. Entomology then became squeezed out with him by other occupations, such as Photography and Rose-growing. But, latterly, the pursuit of Entomology was again taken up, and, assisted by his son, his collection rapidly increased.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY: *January 26th*, 1888.—T. R. BILLUPS, Esq., F.E.S., President, in the Chair.

Mr. Tugwell exhibited, for comparison, German and Welsh specimens of *Xylina furcifera*, Hufn. Mr. J. Stringer, varied series of *Hybernia defoliaria*, Clerck. Mr. Cooper remarked that whilst searching for *H. leucophæaria*, during the previous week, he had seen numbers of *H. defoliaria* at rest on the trees, and it now seemed usual to meet with this species in the spring. Mr. Adkin, bred specimens of *Ptilophora plumigera*, Esp., which had recently emerged, and thought that the cold weather experienced at the time the species usually appeared had kept them back. Mr. Carrington contributed notes as to the effect of temperature on the emergence of *Lepidoptera*. Mr. Tutt, on behalf of Mr. Alderson, varieties of *Aplecta tincta*, Brahm., *Scopelosoma satellitia*, L., *Anaitis plagiata*, L., a melanic specimen of *Phigalia pedaria*, Fb., and a curious form of *Tæniocampa munda*, Esp., which he stated were all taken in the neighbourhood of Bromley. Mr. Carrington said that he had frequently taken this form of *T. munda*. Mr. Billups, on behalf of Mr. W. F. de V. Kane, *Rhopalomesites Tardii*, Curt., from Killarney and Powerscourt, Ireland, and invited remarks upon the same as regards variation; the pale forms, however, were considered to be immature. Mr. Dobson read a paper on "Darwinism," which was followed by a discussion.

February 9th, 1888.—The President in the Chair.

Messrs. F. Warne, N. Warne, A. T. Mitchell, F. E. Strong, and P. C. C. Billups, M.D., were elected Members.

Mr. South exhibited, for comparison, forms of *Dianthœcia compta*, Fb., and *D. nana*, Rott., and contributed notes; also long series of what he said were known in this country as *Cerastis vaccinii*, L., and *C. spadicea*, Hb., which he considered were two forms of one species, but, at present, was unable to bring forward any evidence of sufficient weight in support of this, but thought he could establish the fact that British Lepidopterists had for years been in error in accociating Hübner's name of *spadicea* with the dark *Cerastis*, which, after comparison with German species of the genus, must be referred to *Orrhodia ligula*, Esp., but whether *ligula* was distinct from *vaccinii* was a question for further research. Long series of British and German forms were shown to illustrate this. And, on behalf of Mr. Leach, Mr. South showed examples of *Coleoptera* mounted on small triangular pieces of glass, thus allowing the under surface to be examined. Mr. Tutt, *Xylophasia rurea*, Fb., showing the different forms of variation. Mr. Hawes, a variety of *Epinephele Janira*, L., one of the upper-wings being completely bleached, and a variety of *Argynnis Paphia*, L., both these varieties were taken in the New Forest, 1885. Mr. Jäger, an aberration of *Vanessa Antiopa*, L., the white border of the upper-wings being suffused with blue spots, the specimen having been bred in Germany, with another in which the aberration appeared also on the under-wings. Mr. R. Adkin, the life-history of *Ephestia Kühniella*, Z., in a living state, and called attention to a colony of larvæ just emerged and making their way into the flour. Mr. Croker, a specimen of *Crioceris merdigera*, F. Mr. T. R. Billups, on behalf of the Rev. W. F. Johnson, of Armagh, a short series of *Bembidium Clarkii*, Daw., taken at Armagh.—H. W. BARKER, *Hon. Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON: *February* 1*st*, 1888.—Dr. DAVID SHARP, F.Z.S., President, in the Chair.

The President nominated Sir John Lubbock, Bart., M.P., F.R.S., Mr. Osbert Salvin, M.A., F.R.S., and Lord Walsingham, M.A., F.R.S., Vice-Presidents for the Session 1888 to 1889.

Mr. Henry F. Dale, F.R.M.S., F.Z.S., of Miserden, Gloucestershire, and 2, Savile Row, W., was elected a Fellow.

Mr. F. Pascoe exhibited two specimens of a species of the Hemipterous genus *Ghilianella*, one of which he found crawling over a low bush at Pará with the young larva securely riding on its back. He said it was the only occasion he ever saw the species with the larva, which was new to Mr. Bates.

Dr. Sharp exhibited insects collected by Mr. Alexander Carson, on Kavalla, an island in Lake Tanganyika. The *Coleoptera* were nearly all well-known species, exemplifying the fact that many of the commoner insects of tropical Africa have wide distribution there, some of these species being common to both Natal and Senegal. The most remarkable of the insects was a large Lepidopterous caterpillar; it was covered with very thick sharp spines, all pointed except the terminal which was furcate.

Mr. Champion exhibited specimens of *Casnonia Olivieri*, Buq., *Œdichirus*, *unicolor*, Aubé, *Paussus Favieri*, Fairm., *Colydium elongatum*, Fab., *Endophlœus spinulosus*, Latr., *Hetærius arachnoides*, Fairm., *Pseudotrechus matilatus*, Rosenh., *Singilis bicolor*, Ramb., *Phyllomorpha laciniata*, Will., all recently collected by Mr. J. J. Walker, R.N., at Gibraltar, Tetuan, and Tangier.

Mr. R. South exhibited a remarkable variety of *Polyommatus Phlæas,* caught by him in North Devon in 1881.

Mr. R. W. Lloyd exhibited a living specimen of the species of *Ocnera* taken in London amongst merchandise imported from Ispahan.

Mons. A. Wailly exhibited, and read notes on, a number of cocoons of *Antheræa assamensis, A. Roylei, Actias Selene, Attacus ricini,* &c., lately received from Assam; also a number of nests of cocoons of *Bombyx rhadama*—the silk of which is used by the Hovas in the manufacture of their stuffs called "Lambas"—from the island of St. Mary, Madagascar.

Mr. H. J. Elwes read a paper on "The Butterflies of Sikkim," the result of many years of collecting in that wonderfully rich district of the Himalayas. He said he had been enabled to complete his observations during the enforced delay at Darjeeling of Mr. Macaulay's Mission to Tibet, of which he was a member. He stated the number of species occurring in this small district to be about 530, which is greater than the number hitherto found in any other district in the Old World. Of these the greater part only occur in the hot valleys at an elevation of 1000 to 3000 feet, and these are for the most part of a purely Malayan character, whilst those found in the middle zone are in many cases peculiar to the Himalayas; and the few species from the alpine parts of the country at 12,000 to 16,000 feet are of a European or North Asiatic type. An important feature in this paper was the numerous observations taken on the habits, variation, seasons of appearance, and range of altitude at which the various species occur, for which Mr. Elwes said he was largely indebted to Herr Otto Möller, of Darjeeling. The paper concluded with an analysis of the species and genera as compared with those found in the North-West Himalayas and in the Malay Peninsula. Mr. J. H. Leech, Dr. Sharp, Mr. Elwes, and others took part in the discussion which ensued.—H. Goss, *Hon. Secretary.*

TROPICAL AFRICAN *COLEOPTERA*; CHIEFLY FROM THE ZANZIBAR MAINLAND.

BY H. W. BATES, F.R.S., &c.

(*Concluded from page* 203).

ONTHOPHAGUS PANOPLUS.—*Late oblongus convexus, subæneo-niger opacus; capite brevi, obtuse triangulari, granulato et punctulato, media fronte tuberculo minuto, vertice latissime carinato et tri-cornuto, cornubus lateralibus valde curvatis, elongatis compressis, apice truncatis, cornu mediano validiori, breviori, recto, lateraliter compresso, apice verticaliter bifurcato: thorace magno* (*elytris longiori et latiori*) *margine prope angulos posticos haud dentato, medio dorso antice late et profunde excavato lævi, cornuque obliquo elongato paullo compresso rugoso; thorace postice et lateraliter æqualiter discrete granulato: elytris striatis, interstitiis subtilissime striguloso-alutaceis sparsim granulatis. Subtus cum pedibus niger politus.* *Long.*, 14 *mm.*, ♂.

Mamboia (Mr. Last).

Distinguished from the allied species of the group by the extraordinary development of the centre point of the posterior carina. It forms a robust horn, inclined towards the long dorsal horn of the thorax, and at the apex dilated and furcate, the fork being in the plane of the axis of the body, not transverse.

Onthophagus chrysopes.—O. semiris (Thoms.) *affinis. Caput et thorax læte rufo-aurata, elytra cæruleo-violacea, pygidium pedes et pectus viridi-ænea. Caput passim grosse* (*haud profunde*) *granulato-rugosum, oviforme basi truncato, clypeo marginibus reflexis media fronte tuberculo parvo, vertice carina brevi parum elevata utrinque breviter erecte cornuta; thorace dense oblongo-granulato versus basin medio læviori et punctulato, medio prope marginem anticum tuberculo brevi; elytris obsolete striatis, sat dense setifero-punctulatis: pygidio corporeque subtus fulvo-pilosis.* ♂. *Tibiæ antice apice intus spiniformiter productæ.* *Long.*, 14 *mm.*, ♂.

Nguru, E. Africa (Dr. Baxter).

The triangular median lobe of the base of the thorax is much less depressed than in *O. rangifer*, *lanista*, &c. In the short bicorned crown, the species resembles *O. semiris* (Thoms.), from the Gaboon.

Onthophagus cometes.—O. semiris *similis sed valde differt vertice unituberculato, etc. Cupreus antice viridi-auratus elytris fusco-cupreis, dense breviter fulvo-pilosus: capite ovato* (*basi truncato*) *crebre granulato vertice uni-tuberculato; thorace passim dense asperato-punctato, lobo triangulari basali depresso solum lævi, dorso longitudinaliter impresso nec tuberculato: elytris sat exarato-striatis interstitiis crebre asperato-punctulatis. Corpus subtus cum pedibus cupreo-auratus nitidus.* ♀. *Tibiæ anticæ apice intus simplices.* *Long.*, 12 *mm.*, ♀.

Gaboon.

Both sexes, doubtless, have the same armature of the head, such being the case in *O. semiris*, which is bituberculated, and in *O. Brucei*, which is unituberculated.

Onthophagus dicella.—*Brevis, robustus, convexus, castaneo-fuscus, sublævis, elytris basi obscure rufo-maculatis: capite subtiliter punctulato, margine flexuoso, clypeo antice valde sinuato-angustato apice reflexo et obtuse bidentato, carina anteriori obtuse arcuata, posteriori acutiori recta; thorace valde transverso angulisque anticis late falcatis, antice lævi, subverticali bi-concavo, dorso valde convexo, antice cornu lato divaricato-furcato, horizontali, armato, postice punctulato* (*versus latera granulato*) *basi integriter marginato medio perparum angulato: metasterno haud carinato: elytris subtiliter punctulato-striatis, interstitiis planis alutaceis sparse minute setifero-punctulatis.* *Long.*, 13 *mm.*, ♂.

Mamboia (Mr. Last).

Onthophagus crœsulus.—O. helciato (Har.) *affinis; brevis, igneo-cupreus elytris cupreo-rufis; capite plano inermi, punctulato, clypeo apice late et alte reflexo subsinuato; thorace dorso in gibbere subcuboidali elevato, profunde sat dense sed discrete punctulato, basi medio leviter angulato* *integriter marginato: elytris leviter punctato-striatis interstitiis sat crebre asperato-punctulatis: pygidio convexo, crebre, discrete et profunde umbilicato-punctulato; tibiis anticis extus et inter dentes denticulatis.* ♂. *Vertex tuberculo minuto. Thorax gibbere fortius elevato antice utrinque angulato, dorsoque utrinque sub angulum profunde concavo sublævi.* ♀. *Vertex tuberculo transverso vel breviter carinato. Thorax gibbere multo obtusiori et antice utrinque perparum concavus.* *Long.*, 7—9 *mm.*, ♂ ♀.

Natal.

Belongs, with *O. helciatus*, from north-east Africa, and the following, to a small group of African species, which have a cuboïdal thoracic elevation (quadrate and vertical anteriorly, in well-developed males), and the head distinguished by its plane surface, and the absence of the usual sharp carinæ and armature.

ONTHOPHAGUS EPILAMPRUS.—O. crœsulo *proxime affinis, differt tantum coloribus, capite cum thorace æneo-aurato elytrisque fuscis, et in sculptura, thorace undique punctis majoribus et minoribus intermixtis. Clypeus apice recurvus rotundatus, verticeque carinula obsoleta, elytris alutaceis sericeo-opacis, interstitiis sparse et tenuissime setifero-punctulatis; pygidio subopaco subtiliter setifero-punctulato; corpore subtus cum pedibus obscure æneus, femoribus rufescentibus.* *Long.*, 9 *mm.*, ♀.

Cameroons.

DIASTELLOPALPUS QUINQUEDENS.—Onthophago lamellicolli (Quedenfeldt) *affinis: differt colore cupreo-fusco carinaque posteriori capitis quinquedentata. Late oblongo-ovatus, robustus, convexus, supra brevissime subtus longius fulvo-fusco pubescens; capite sat elongato triangulari-semiovato; thorace ante medium valde rotundato-dilatato deinde profunde sinuato-angustato, angulis posticis rotundatis basi utrinque flexuoso medio producto-triangulari planato; antice verticali et supra flexuoso-carinato, carina medio breviter lobato-producto, lobo apice lato levissime sinuato, antice medio sub lobo concavo polito, cætera superficie discrete granulato prope medium basin lævi excepto: elytris subtiliter punctulato-striatis, interstitiis planis sat crebre sed discrete aspere punctulatis.* *Long.*, 16—22 *mm.*, ♂ ♀.

Mamboia, East Central Africa (Mr. Last).

Closely allied to *O. lamellicollis* (Quedenf.), of West Central Africa, but differing in the posterior highly-raised carina having (in all developments) five small teeth instead of four; of the five the central one is always distinctly formed, those at the outer angles are also well-marked, but the intermediate two are always obtuse, and in the lower developments indicated only by a slight undulation. The colour is dark, slightly brassy or coppery-brown, with the thorax always distinctly coppery. The sexes show no distinction in the apex of the anterior tibiæ; the only apparent differential characters being in the longer (♀) or shorter (♂) apical ventral segment.

The genus *Diastellopalpus* has been recently founded by von Lansberge, to include *D. tridens*, *D. noctis*, *D. Johnstoni*, and *D. lamellicollis*, a natural group, in which the first joint of the labial palpi is triangularly dilated, and the antennal club cupuliform. In all the species the metasternum anteriorly has a prominent carina, with a more or less free and acute apex.

DIASTELLOPALPUS THOMSONI.—*Late oblongo-ovatus, subtus chalybeus supra capite thorace et pygidio viridi-æneis (sub-cœruleis) elytris nigris nitidis: clypeo semiovato grosse scabroso: thorace ante medium dilatato (angulis anticis breviter falcatis) postice valde sinuato-angustato angulis rotundatis, medio basi paullulum producto-triangulari ibique nec planato sed sulculo profundo basali interrupto; supra grosse distanter granulato disco posteriori aspere punctato; elytris striis punctulatis vix impressis interstitiis planis confuse sed discrete setifero-punctulatis.* ♂. *Carina frontalis brevis, verticeque cornu brevi triangulari erecto armato. Thorax antice verticalis lævis et supra breviter quadridentatus, dentibus duobus intermediis per carinam brevem angulatam conjunctis et antice verticaliter obtusius carinatis, dentibus exterioribus majoribus liberis.* ♀. *Carina frontalis elongata valida, verticeque carina quadridentata. Thorax antice sub-verticalis carina brevi, bituberculata fere sicut in* ♂ *sed dentibus lateralibus nullis.*

Long., 16—20 *mm.*, ♂ ♀.

Taveta, Kilimanjaro (Mr. Joseph Thomson).

The anterior tibiæ are not produced at their inner apex in the ♂, but show on the upper surface near the base of the tarsi a smooth tubercle, apparently the rudiment of the apical dentiform process, so frequently distinguishing the ♂ in *Onthophagus*. In. *D. tridens* (Fab.), ♂, this process does not project laterally, but forms a triangular tooth in the same position as the rudimentary tubercle of *D. Thomsoni*, ♂.

DIASTELLOPALPUS EBENINUS.—*Late oblongo-ovatus, robustus, nigerrimus nitidus femoribus plus minusve castaneo-rufis. Clypeus sat breviter rotundato-triangularis rugulosus, carina frontali* (♂ ♀) *valida: thorace postice valde sinuato-angustato, angulis anticis haud recurvis posticis rotundatis, margine basali medio subacute productis ibique breviter carinato vel denticulato, dorso passim crebre sed discrete punctato-granulato, postice tantum punctato: elytris politis subtiliter punctulato-striatis, interstitiis fere planis sat crebre setifero-punctulatis setis nigris.* ♂. *Carina verticis alta fere ab oculo usque ad oculum extensa, verticaliter sub-arcuata. Thorax antice alte verticalis haud profunde punctatus, suprà carina valida verticaliter arcuata, utrinque fere usque ad foveam lateralem extensa.* ♀. *Carina verticis altior, curvata, angulis utrinque dentiformiter productis.* *Long.*, 16—19 *mm.*, ♂ ♀.

Cameroons and Old Calabar. Four examples.

The armature of the ♂ so much resembles that of the opposite sex generally in the *Onthophagi*, that I should have hesitated to describe the single specimen as a ♂ if it were not for the corroboration afforded by the produced and angulated inner apices of the anterior tibiæ, the same being obliquely truncated in the other three (♀) examples.

DIASTELLOPALPUS MONAPOÏDES.—*Late subquadrato-ovatus, nigro-nitidus: clypeo semiovato, subtriangulari, grosse discrete granulato: thorace brevi et lato, angulis anticis subfalcatis postice valde sinuato-angustato angulis posticis rotundatis, basi vix flexuoso et medio parum producto ibique sulco marginali anguste interrupto, dorso aspere verrucoso polito: elytris interstitiis valde convexis sparsim setifero-punctulatis (setis nigris) striis in fundis vix impressis.* ♂. *Carina frontalis parum elevata, verticeque in cornu acuto robusto sed parum elevato, retrorsum curvato, armato. Thorax antice alte verticalis, brevis, supra cornubus brevibus et validis quatuor quorum intermediis (oblique spectantibus) sinu subtiliter carinulato separatis, duobus exterioribus porrectis liberis a cornubus medianis sinu profundo separatis. Tibiæ anticæ supra prope tarsos leviter tuberculatæ.* *Long.*, 24 *mm.*, ♂.

Mamboia (Mr. Last). One example.

A distinct and remarkable species, somewhat resembling the Australian *Onthophagus (Monapus) pentacanthus*, Harold.

PHALOPS EUPLYNES.—Ph. Wittei (Har.) *proxime affinis; differt interalia genis triangulariter lobatis. Viridi-æneus, elytris flavo-testaceis parce fusco-marmoratis: clypeo dimidio anteriori polito sparsim punctulato, postice setifero-punctato, gradatim acuminato apice reflexo subacuto, lamina occipitali fissa nutanti, utrinque intus unidentata: thorace æqualiter et sat distanter granulato toto griseo-pubescenti: elytris vix nitidis breviter griseo-setosis, interstitiis planis, subtilissime alutaceis et disperse granulatis: subtus nigro-nitidus.*

Long., 12 *mm.*, ♂.

Damara Land (Andersson).

Differs from *P. Wittei* and *P. Dregei* in the genæ being dilated into a sub-triangular lobe (rounded at the apex), different in shape from the same part in all other species of *Phalops*. The head, from the hind part of the clypeus nearly to the summit of the long fissile occipital plate, is clothed with long, erect, grey hairs. The pubescence of the thorax is recumbent and curled; that of the elytra similar, but more sparsely scattered.

Family *CETONIIDÆ.*

FORNASINIUS VITTATUS.—*Oblongus, nigro-nitidus, thorace lineis impressis quinque elytrisque vittis suturali et marginali aliisque* 2—3 *intermediis cretaceo-tomentosis. Thorax fere æqualiter convexus paullo ante medium dilatatus, disperse punctatus, lateribus cum angulis posticis rotundatis; elytris subtilius disperse* *punctatis; scutello nigro nitido utrinque sulcato. Subtus nigro pilosus.* ♂. *Clypeus antice paullo dilatatus angulis lateraliter exstantibus, margine anteriori medio cornu erecto gradatim leviter dilatato apice sinuato-truncato; fronte plana, granulata bicornuta, cornubus brevibus antrorsum curvatis. Tibiæ anticæ validæ compressæ, extus acute tridentatæ.* *Long.*, 45 *mm.*, ♂.

Southern Masai Country, near Ugogo (Dr. Baxter).

Differs from the two previously described species by many characters, the chief of which is the narrow clypeal horn, gradually and slightly dilated towards its apex, where it is sinuate-truncate, instead of bifurcate. The chalky tomentose markings of the elytra are arranged in longitudinal stripes, the marginal one being the broadest, and continuing round the apex to the narrower sutural vitta, two other shorter discoidal vittæ being partly dilacerated. There is also a large basal spot on each elytron.

CERATORHINA (DŒDYCORHINA) MACULARIA.—*Mediocriter elongata, antice et postice angustata, supra deplanata, velutino-opaca, erecte pilosa; olivaceo-fusca; capite, pedibus (tarsis nigris exceptis) vitta utrinque obliqua prothoracis, scutello maculisque plurimis elytrorum, fulvo-rufis; elytris sutura et costis utrinque duabus elevatis. Processus sternalis fere sicut in* C. nireus *mediocriter productus sed paullulum acutior et sutura in medium sita.* ♂. *Clypeus latissimus, quadratus, angulis acutis, medio in cornu lato suberecto postice profunde concavo, elevato: fronte toto valde concava margine utrinque alte et acute elevato tridentato; vertice medio sub-horizontaliter cornuto cornu juxta basin angulatim dilatato et apice sinuato-truncato. Pedes antici elongati, graciles, tibiæ arcuatæ, apice intus et extus acute productæ, et extus (haud procul ab apice) unituberculatæ.*

Long., 27 *mm*, ♂.

Mamboia (Mr. Last).

This very remarkable species does not fall into any of the numerous sub-genera into which the genus *Ceratorhina* has been divided, a new generic name (*Dœdycorhina*, in allusion to the scoop-formed nasal horn) is, therefore, proposed for it. The long, rather narrow and bowed anterior tibiæ are unlike those of any other species of the group, but they somewhat resemble the form shown in *Ischnoscelis Dohrni*, Westw. In the velvety surface and markings, the species resembles the *Chordoderæ*. The tawny-red spots of the elytra are, on each, 10—12 in number, extremely irregular in size and arranged longitudinally, those near the suture tending to form short fasciæ.

Carleton Road, Tufnell Park:
February, 1888.

ERRATUM.—The length of *Onthophagus Plato* (*ante*, p. 203) should be 21 mm., not 31 mm., as printed.

TORTRICES IN NORFOLK IN 1887.

BY C. G. BARRETT, F.E.S.

This district is so rich in *Tortrices* that it would be manifestly ungrateful in me to allow a season to pass without some notice of them.

Tortrix Lafauryana, Ragonot.—As a matter of course, I looked eagerly for the larva of this fine species: following Mr. Atmore's friendly directions, and having, through the good offices of a kind friend, obtained admission to the strictly guarded (and rich) game preserves in which it loves to dwell, was not disappointed. The green larva was readily discovered in its tube of upright joined leaves in the top of the shoot of *Myrica gale*. Here it appears to be little troubled with parasites, for I think that we reared almost every larva obtained. The moth is rather sluggish, flying only on the most favourable evenings. The large size of the body of the female must render flight laborious.

Tortrix decretana, Tr. (*cf. ante*, p. 125).—Several specimens of this novelty occurred, reared, I believe, among common species, but I overlooked them at the time, taking them to be pale varieties of *Podana*, which the species closely resembles in both sexes; indeed, these specimens are much more like typical *Podana* than are some aberrations of the latter. The shape of the wings in the two species is precisely the same, but the whole tone of colour in *decretana* is paler, the ground-colour of its hind-wings being whitish in both sexes, with grey shading and a *faint tinge* of reddish-brown at the apex, while the fore-wings in the male are of a lighter chocolate-red, and of the female a slightly paler brown. The only distinguishing character that seems really reliable is in the shape of the line forming the anterior margin of the central fascia. In *Podana* this line is very oblique, but not angulated, only slightly curved or sinuous; while in *decretana* it is twice or thrice angulated; after crossing the costal cell it turns abruptly along the nervure away from the base, then abruptly again across the discal cell, thus forming two right angles, then bends again in the previous direction, and passes with a decided curve to the middle of the dorsal margin. It is curious that the most reliable distinguishing character in several of the species of this group is to be found in the form of the same transverse line. *Decretana* is recorded from Germany, Switzerland, and Russia. Its larva, according to v. Tischer, is very similar to that of *Podana*, but without the little black shield on the anal flap. Feeding on birch and hazel in June.

Tortrix cinnamomeana, Tr.—Not common, but occasionally met with.

Penthina corticana, Hb. (*picana*, Froel.).—This very pretty species was not scarce among birch in June and July; *betuletana*, Hw., taking its place in August.

Penthina capreana, Hb.—Mr. Atmore found some larvæ in May, from which he reared a lovely series. I was not so fortunate, but specimens of the moth occurred all through July in widely separated places. They seem to rest high up in the large sallow bushes, and often fall to the ground with hardly a flutter when disturbed. They are a little more active after sunset, and probably fly at night.

Penthina sellana, Hb.—A very few specimens occurred in the dry open places frequented by *Eupœcilia anthemidana*, near Thetford.

Phlœodes Demarniana, F. R.—This species, which used to be taken in the London district, has apparently been rare for many years. I took two or three at West Wickham thirty years ago, and had never seen a living specimen since. Mr. Atmore and his brother have taken single specimens in several recent years, but in the past summer it must have been more common, for between Mr. Atmore, my son, and myself, more than a dozen were secured. It appears to rest on the branches of well-grown birch trees, and to prefer the higher branches, so that it is difficult to disturb, and, consequently, more difficult to capture, requiring *one* to beat the branches, *another* to capture the moth.

Sericoris bifasciana, Hw.—Occasionally among firs near Lynn and near Thetford; in the latter locality I saw it sitting upon the loose brown scales which form the blossom of the fir—*Pinus sylvestris*,—evidently just emerged and in great beauty. From a lot of shoots and blossoms of fir very kindly sent me from Bournemouth by Mr. McRae, I reared a most beautiful series of this species, most of them of the lovely pink colour, which is not always observable in captured specimens. They appeared from the middle of June to quite the end of July, by which time *Retinia sylvestrana* was emerging from the same lot of fir blossoms.

Sericoris micana, Froel. (*olivana*, Tr.).—I was very glad indeed to renew my acquaintance with this pretty species in a marshy spot in one of the river valleys. It was flying about a patch of *Spiræa ulmaria* and other marsh plants, restricting itself—quite unnecessarily—to a very few yards of the marsh. The few females observed seemed to hide among tall grass under the sallow bushes.

Pœdisca ? rufimitrana, H.-S.—I had the pleasure of making the acquaintance of this species in the living state at Merton, under the guidance of Mr. Hartley Durrant. I was late for it—the beginning of August—and it was getting worn, but we obtained several good specimens from trees of *Abies cephalonica*. It seems to be principally attached to this handsome fir, which grows in plenty, and in great vigour and beauty at Merton Hall.

Mixodia Ratzeburghiana, Rtz.—This species was not uncommon at the same time and place, but occurred only among *Pinus sylvestris*. Subsequently a single specimen turned up near Lynn, where it had not previously been observed.

Mixodia rubiginosana, H.-S.—This species also occurred near Lynn, in June: half a dozen specimens being beaten out of one or two young trees of *Pinus sylvestris*. None could be found except in these trees, although the fir was plentiful around. Probably these were all produced from the eggs of a wandering female in the previous year, for this was its first occurrence in the locality, although single specimens have been taken in several previous years, within a few miles, by Mr. Atmore. It is most interesting to notice the gradual spread of this species (*Bouchardana*, Dbl.) over the country. Formerly, it was only taken in the highlands of Perthshire, and was there a great rarity ; after a time it was found more commonly near Paisley; more recently it has occurred somewhere in the London district (although the locality is very naturally kept a profound secret by the captors), and this year it occurred near Thetford, as well as here. Doubtless, it is sometimes introduced with young trees from Scotland, but it takes kindly to inadvertent acclimatisation, and will probably be known in time wherever Scotch fir grows in plenty.

Phoxopteryx diminutana, Hw.—This graceful species has been rather commoner than usual, always about sallow bushes in marshy places, but sluggish and hard to take, except at sunset, when it flies. In the day-time it darts to the ground when disturbed, and is generally secure from capture ; but my friend Mr. Atmore circumvented some of them even then, for they *could not* endure his tobacco smoke.

Phoxopteryx uncana, Hüb.—Most abundant on a marshy heath, and interesting from the beauty and size of many of the specimens.

Phoxopteryx biarcuana, Stph., and *inornatana*, H.-S. (*subarcuana*, Dougl.).—Both more than usually plentiful among *Salix fusca*, and the former species very fine and handsome. Of the latter I noticed a second brood in August.

Phoxopteryx siculana, Hb. — Among its food-plant, *Rhamnus frangula*, but scarce.

Catoptria candidulana, Nolck.—Flying in plenty late on sunny afternoons in July over its food-plant, *Artemisia maritima*, settling on the shoots, and apparently on little else, but constantly buzzing, in the manner of its allies, about the same spot. Excessively local.

Orthotænia ericetana, Westw.—Not scarce in rough fields.

Eupœcilia dubitana, Hb.—Common in rough fields, where its usual food-plants *do not* grow. Appeared principally to frequent *Carduus arvensis.*

Eupœcilia udana, Gn.—Among *Alisma plantago*, occasionally, and at long intervals. Varying more than usual in size.

Eupœcilia notulana, Z.—Local, in a marsh, among *Mentha hirsuta.*

Argyrolepia subbaumanniana, Wilk.—Found, but rarely, in a chalk-pit, to which I made a pilgrimage, in the faith that it would not be absent from the kind of spots it most affects. Not previously found in this district.

King's Lynn, Norfolk :
January 19*th*, 1888.

DESCRIPTIONS OF THE LARVÆ OF *BUTALIS SICCELLA* AND *B. VARIELLA.*

BY E. R. BANKES, M.A., F.E.S.

BUTALIS SICCELLA.

In my notice of this species in Ent. Mo. Mag., xxiii, 275—6, I expressed the opinion that *Thymus serpyllum* might very likely prove to be the food-plant of the larva, and subsequent investigation has shown that surmise to have been correct, as far as it went.

On May 5th, 1887, I made an expedition down to the locality near Weymouth, where I had, in the previous year, captured specimens of *B. siccella*, with the fixed determination to discover the larva. At first I could make nothing of it, owing to the dampness of the sand from recent showers, but, by dint of perseverance, my efforts were finally crowned with success, for I discovered unmistakeable *Butalis* larvæ (which could, I knew, belong to no other species but *siccella*), living in long silken galleries attached to half-buried stems of *Thymus serpyllum* and *Lotus corniculatus*, both of which plants showed evident signs of having been freely eaten by the larvæ. It seems that they also *occasionally* turn their attention to other plants, such as *Plantago lanceolata*, as I found the tubes attached to several partially hollowed-out leaves.

Unfortunately the larvæ continue feeding for a very long time, and are most difficult to rear, as, in spite of every possible care and attention, I only succeeded in breeding four specimens out of a large number of larvæ, and Mr. W. H. B. Fletcher had no better result from the batch of larvæ I sent him.

The following description was taken on May 7th :—

Head horny, polished, brownish-black ; plate on second segment dark brown, and polished. Body very long, thin, and cylindrical, dull reddish-purple, with the spaces between most of the segments showing paler and of a pinkish hue, but greenish-white between the first four segments ; no dorsal or sub-dorsal lines or spots, but there is one paler pinkish stripe along each side in the region of the spiracles. Anal segment with a rather small, horny, polished, brownish-black plate ; ventral surface and prolegs reddish-pink ; anterior legs black and highly polished.

Length, about 4½ lines.

The larvæ live on the surface of and below the sand, in very long silken tubes, composed of sand and silk interwoven, and attached to half-buried stems of *Thymus serpyllum* and *Lotus corniculatus*. I was unable to discover the position of the pupa, but it seems probable that it is enclosed in a silken cocoon just below the surface of the sand, as in the case of *B. variella*.

The perfect insects (four in number) emerged from July 3rd to 12th. I can now corroborate the statement of Professor Zeller (quoted in the Ent. Mo. Mag., xxiii, p. 275) as to the fondness of *B. siccella* for frequenting flowers in the sunshine, as I found them extremely partial to those of *Hypochæris radicata*, from which they could be boxed with a little dexterity. The blossoms, on which Prof. Zeller had particularly noticed them, were those of *Jasione montana* and *Potentilla argentea*.

BUTALIS VARIELLA.

Wishing to compare *Butalis variella* with *B. siccella* in the larval state, I paid a visit to the locality for the former on May 16th, 1887, and procured a good supply of larvæ, which, when placed side by side with those of *B. siccella*, at once proved these two species to be totally distinct, although the differences between the perfect insects (already pointed out in Ent. Mo. Mag., xxiii, pp. 275—6) could leave but little room for the doubts expressed by von Heinemann as to their specific distinctness.

The larva of *B. variella* was, I believe, altogether unknown until discovered by the Rev. C. R. Digby on April 3rd, 1883, but, as no notes on it have yet been published, with his permission I append a description taken on May 17th :—

The narrow, pointed, and much flattened head is black, horny, and highly polished ; it is retractile into the 2nd segment, which is much broader, and covered by a horny, polished, dark brown plate. Body very long and cylindrical, dull purplish-brown, with no dorsal or sub-dorsal lines or spots, and not showing paler between the segments ; there is a single stripe, rather lighter in colour than the body, along each side in the region of the spiracles ; anal segment shining, dirty yellowish-brown, with no darker plate. Ventral surface and prolegs dirty brownish-yellow ; anterior legs black, and highly polished. Length, 5—6 lines.

The larvæ live on the surface of and below the sand, in very long silken tubes, composed of sand and silk interwoven, and attached to half-buried twigs of *Calluna vulgaris* and *Erica cinerea*, upon which they feed. The tubes inhabited by this species often measure several inches in length, while those of *B. siccella* are equally long in proportion to the size of the larva. The pupa is enclosed in a rather long curved cocoon just below the surface of the sand.

I may add that, like *B. siccella*, this species is exceedingly difficult to rear into the perfect state, and the larvæ, at any rate in confinement, seem to continue feeding for an almost interminable length of time. Although I am well acquainted with the larvæ, and have several times tried to rear them, I have never yet succeeded in breeding even a single specimen of the moth, though the Rev. C. R. Digby has been rather more fortunate with them.

The Rectory, Corfe Castle :
February 10*th*, 1888.

DESCRIPTION OF THE LARVA OF *LEUCANIA TURCA*.

BY G. T. PORRITT, F.L.S.

On the 24th July, 1886, I received from the Rev. C. R. N. Burrows, of Brentwood, a good supply of eggs of *Leucania turca*. They were from two ♀, and were deposited in rather large batches, out of sight, in the crevices of the chip box ; and in a state of nature would, no doubt, be placed either under bark, or in the crevices of grass. They were glossy, pale straw colour, with deep depression on the upper-side.

On the 27th I found they were hatching, and the newly-emerged larvæ were smoky-olive, with brown head, and darker brown mandibles. They throve well on short grasses, and on *Dactylis glomerata*, and by August 28th were about five-eighths of an inch long. Body cylindrical, and of nearly uniform width ; head polished, slightly narrower than the second, and still narrower than the third segment, the lobes rounded; skin soft and smooth. Ground-colour rich dark green, more or less (in different specimens) dusted with yellowish-brown, some, indeed, being entirely yellowish-brown; head pale brown, the ocelli, mandibles, and some marks near the top of each lobe, darker; a line, bluish on the posterior segments (paler in the brown larvæ), and white on the anterior segments, edged on each side with a smoky line, forms the dorsal stripe; sub-dorsal lines waved, of the same colour, but less distinct, as is also a straighter line above the spiracles; the broad spiracular stripe yellowish-white, intersected throughout by a narrow green line. Ventral area, legs and prolegs, uniformly dingy greenish, or yellowish-brown, in accordance with the prevailing colour of the dorsal area.

I described them again on November 2nd, when they seemed to be hibernating, though even then they evidently fed during mild evenings.

Length, about three-quarters of an inch, and moderately stout in proportion; head glossy, with the lobes rounded, a very little narrower than the second segment; body cylindrical, and of almost uniform width; skin smooth, and the segmental divisions distinctly defined. Ground-colour reddish-brown, marked with smoke colour; head yellowish-brown, with dark mandibles; dorsal line yellowish-white, finely edged with smoke colour, and on it, at the segmental divisions, a smoke-coloured spot; sub-dorsal lines of the same pale colour, but less distinct, also edged with smoke colour; a broad pink stripe extends along the spiracular region; spiracles oblong, black, those on the 12th segment enclosing a pale spot. Ventral surface, legs and prolegs, brownish-pink.

At the end of May, some of the larvæ appeared to be full-grown, and on the 29th I described them as follows:—

Length, about one and quarter inches, and proportionately stout; head glossy, with the lobes rounded, a little narrower than the second, and still narrower than the third segment; body obese and cylindrical, tapering a little towards the head, and somewhat abruptly at the anal extremity; skin soft and smooth, but when the larva is crawling, the segments are considerably puckered, and that, together with the distinct segmental divisons, gives to it a wrinkled appearance. Ground-colour of the dorsal area ochreous-yellow, thickly freckled with smoke-coloured and purple dots, and on the anterior segments strongly suffused with purple; head and corselet brown, the former thickly dotted with paler spots; the straight pale ochreous medio-dorsal line, extending (as do also the sub-dorsal lines) right through the corselet, clear and distinct; and at each division of the segments, on this line, is a large conspicuous smoky mark; sub-dorsal lines waved and less conspicuous, also ochreous; spiracles large and distinct, black, with pale centre and edging; below the spiracles and throughout the ventral area the ground-colour is also ochreous, thickly freckled, and anteriorly strongly suffused with purple, but, being without the admixture of smoke colour, is paler than the dorsal area.

The first larva went down on the 4th, and the last on the 16th of June; the moths emerged during the early part of July, most of them during my absence from home.

Huddersfield: *March 3rd*, 1888.

EPHESTIA SEMIRUFA (HAW.?), STN.

BY JOHN H. WOOD, M.B.

Just opposite one of my windows stands a fine old ivy bush, and one dark night in September, 1886, when *Noctuæ* were coming freely to a light in the room, there flew in along with them a rather worn knot-horn, that did not quite look like the common *Ephestia elutella*; so, instead of being dropped there and then into the ammonia bottle, it was put on one side with the hope that, as it was a female, eggs might be obtained. A few were fortunately laid, and they soon hatched. The larvæ fed up the same autumn on nut-kernels, spun their cocoons in rolls of paper, and pupated some time in May, the perfect insects (2 ♂, 2 ♀) coming out in June. Specimens were recently sent to Mr. Barrett, who at once pronounced them to be *semirufa*; but I cannot do better than give his own words:—"You cannot easily know how delighted I am to see genuine fresh *Eph. semirufa* such as these unquestionably are, I had almost given up the species as hopeless;" adding, "my notes on this species in the Magazine ten years ago are quite insufficient as a description of it. Will you, therefore, amend them by sending a full description." This I now venture to do:—

♂. ochreous-grey, dusted with dark grey. First line, starting from the costa at junction of inner with middle third, reaches the hind margin just beyond the middle; dark grey, broad and strongly marked as far as the fold, thence to the hind margin, faint and obscure; edged internally by a pale band, rather lighter than the ground colour. Second line rather nearer the hind margin at its inner than its outer extremity; double, enclosing a nearly straight whitish line; dark grey, and strongly marked as far as the fold, and then becoming fainter. The two discal spots are minute, but well defined, and immediately below them are indications of a third spot, a spur apparently from the second line. A row of dark grey crescents along the hind margin. Costa slightly dilated at the base, and with a distinct lappet of hair-like scales. ♀ has almost the appearance of another insect, being much suffused with red, especially at the base, inner, and hind margins. Moreover, the pale included line in the second line has a distinct bend below the costa, equally noticeable in the captured and bred specimens. Hind-wings in both sexes pale grey.

Perhaps the most obvious feature in looking at these bred specimens, and comparing them with *elutella*, is the striking beauty and richness of their colouring, and the singular resemblance of the red females—except for the absence of white scaling—to *Pempelia adornatella*. At the same time the characters, that have usually been relied on to distinguish it from *elutella*, are evident enough, such as the larger size, more arched costa, greater relative breadth of fore-wing, and the narrower, more wedge-shaped, central area, due to the position of the first line. I will now say a word about the costal lappets, flaps of membrane, folded back beneath the fore-wings, and clothed with highly specialized scales. The first point to be noticed is their large size in our insect, as compared with *elutella*. Examined with a pocket lens the body of the flap in *elutella* is seen to be covered with large coarse scales, whilst along its free border is a curled fringe of moderately long hair-like scales. In *semirufa*, the coarse scales are apparently absent, and the whole surface is thickly covered with long, straight, hair-scales, to the great length and number of which the lappet owes its size. Pursuing the subject further, with a sharp lancet I removed a lappet bodily from each insect, and placed them under a microscope. I found that the coarse scales in *elutella* are clavate, and darkly granular from the presence of pigment; and that similar scales, though less numerous, are really present in *semirufa*, but are hidden by the hair-scales. The latter bodies, however, are unmistakeably different in the two insects. In both they may be described as spear-shaped, and provided at the end with a minute projecting point; but in *elutella* they are little more than half as long as in *semirufa*, and are at the same time nearly half as broad again, thus reversing the proportions; their shafts are also curved, which explains the curl in the fringe already mentioned, and they have lancet-shaped ends, whereas in *semirufa* they are blunt-ended. I have entered thus minutely into the subjects of the lappets, because, as they are what we call secondary sexual characters, it seems to me that the differences in their structure are of great importance, and ought to count a long way in settling the question of species, even if they do not absolutely decide it.

The larva is cylindrical, of moderate proportions, tapering but slightly at either extremity. White, tinged on the upper surface with pale smoky. Head pale brown or amber. Thoracic plate black, divided by a pale line. Anal plate also black. Spots black, small, but distinct; the trapezoidals arranged almost in a straight line, one behind the other.

There yet remains one point deserving, perhaps, a few remarks. Although my larvæ took very kindly to their nuts, it is not to be supposed that they feed upon them in a wild state, but, probably, like many of their congeners, they have accommodating appetites, and live on almost any kind of material, animal or vegetable, provided only it be not living. This being so, it may not have been accidental that it was out of ivy that Dr. Jordan beat his specimens many years ago in Devonshire, or that in my own case the same plant grew close at hand, for these old ivy bushes are stored with refuse materials of many kinds, and are, therefore, as likely as not to be the home of the insect. Examining them in various ways, and more especially watching them in still summer evenings, when the *Ephestias* are in the habit of flying, may lead to our turning up the insect in greater numbers, and learning something more about it.

Tarrington, Ledbury:
February, 1888.

NOTES ON DR. HERMANN MÜLLER'S "FERTILISATION OF FLOWERS."

BY EDWARD SAUNDERS, F.L.S.

I have recently had occasion to consult the late Dr. Hermann Müller's "Fertilisation of Flowers," as translated by Mr. D'Arcy W. Thompson, but although I have been, as every one must be, much interested in his remarks on the *Hymenoptera* given at p. 45, *et seq.*, I feel compelled to make a few observations on some of the data on which he founded his deductions, and which appear to me to be incorrect, and, therefore, likely to cause such deductions to be misleading. I do not discuss Dr. Müller's theories as to the ancestry of the *Anthophila*, as I feel myself quite incompetent to do so; but my first remarks shall be on the genus which he considered first among the bees, viz., *Prosopis*.

Of the species of this genus, he says, p. 47: "In their almost hairless bodies, the narrow first tarsal joint, scantily provided with hairs, and their very slightly elongated mouth parts, they completely resemble the sand wasps, and only claim to be admitted to the family of bees by their manner of feeding the young."

Dr. Müller apparently overlooked the beautifully pectinate hairs on the thorax and abdominal bands of the various species of this genus, and also the branched hairs which exist on the coxæ, trochanters, and femora (I have figured a metathoracic hair of *Prosopis*: Trans. Ent. Soc. Lond., 1878, pl. vi, fig. 14), affording characters which, if my observations be correct, distinguish them at once from any of the family of sand wasps. From *Prosopis* Dr. Müller goes at once on to *Sphecodes*, so that he altogether omits *Colletes*, another genus of the *Obtusilinguæ*, which has the tongue short and bifid, as in *Prosopis*, but which is densely clothed in all the known species with beautifully branched hairs, in fact, the hairs of *Colletes* and its kindred Australasian genera *Lamprocolletes*, &c., are probably more strikingly branched than those of any other known genera (for figures of hairs from metathorax and scopa of *Colletes*, see Trans. Ent. Soc. Lond., 1878, pl. vi, figs. 5, 6, 12, 12*a*): also both *Prosopis* and *Colletes* have the lingua beautifully and finely ridged transversely, and set with bristles, a peculiarity which Dr. Müller attributed more especially to the higher *Hymenoptera* (*vide* p. 56), although it exists also conspicuously in some of the sandwasps.

One can hardly help feeling a doubt as to whether the habit of lining the brood cavities with slime can have had much to do with the shape of the tongue. It is hard to see why *Sphecodes*, &c., should require "deeply seated honey" more than *Prosopis*, also (unless this desire be granted for *Prosopis* as well) why if their ancestors, the sand wasps (*fide* Dr. Müller), had short bifid tongues, without any slimy habits, the slimy habit of *Prosopis* should be relied on to account for its conservative tendencies.

Following Dr. Müller to his remarks on *Sphecodes*, at p. 50, one reads: "In *Sphecodes* the whole body is sparingly covered with hairs which show the first traces of feathery branching." As I have already pointed out, far more distinctly branched hairs exist in genera which in Dr. Müller's scale would be placed decidedly lower down; I may here mention a peculiarity in *Sphecodes* and *Halictus*, which, so far as I know, exists in no other genus of the *Anthophila*, viz., that they have no apparent apparatus for projecting the mentum and lingua; in most of the genera this office is performed by what are called the *lora* (or retractors, Dr. M.), these are two joints, each of which swings on the apex of one of the cardines, and are united at their apices, so as to form a Λ-shaped body; the mentum, which bears the lingua at its apex, is attached to the centre of the Λ, and is retracted or projected according as the Λ is inverted or not. In some genera, *Andrena*, *Colletes*, *Prosopis*, and *Panurgus*, the lora do not form distinct arms, but the membrane which covers the space between the cardines is chitinized and darkened towards the apex, where its convexity forms an apical arch; to the centre of this arch the mentum is attached, and the membrane being elastic, the arch performs the same functions as the lora, only, probably, in a less perfect way; but in *Sphecodes* and *Halictus*, I have failed to find either lora or chitinous arch: and in this respect I should say they are decidedly lower down in the scale than *Prosopis* or *Colletes*.

I have mentioned *Panurgus* above as one of those genera in which no distinct lora occur, and in this respect it would appear to be decidedly less advanced than *Macropis*, *Dasypoda*, and *Cilissa*, although in the elongate lingua, and the form of the labial palpi, as well as in the long acute paraglossæ, it advances towards the higher *Apidæ*; this genus, therefore, offers another case which breaks the continuity of such a scale as that proposed in the "Fertilisation of Flowers."

Again, at p. 53, Dr. Müller would appear to have placed *Macropis* on a higher level than *Eucera*, *Anthophora*, &c., on account of its having contracted the "new habit" of "moistening the pollen with honey before placing it in the collecting apparatus;" but *Macropis* is a short-tongued bee, structurally closely allied to *Andrena*, &c., so that in this case structure and usefulness of habit would not appear to have progressed together.

At p. 55, it is said of the *Dasygastræ* that "the whole or nearly the whole ventral surface of the abdomen is covered with a brush of stiff bristles, inclined backwards, which vary in length, closeness, and colour in different species, but are always smooth, without trace of feathery branching." I would only remark here than in many of the species these hairs are beautifully spirally grooved (see Trans. Ent. Soc. Lond., 1878, pl. xi, fig. 3); and in one genus, *Chelostoma*, they have distinct long filamentary branches (see Trans. Ent. Soc. Lond., 1878, pl. vi, fig. 8).

I do not make these remarks in any way to dispute Dr. Müller's theory of the gradual development of the mouth parts in *Hymenoptera*, I only think that there are signs that such development did not occur along the exact lines which he suggested; and having noticed these little inaccuracies, which happen to be in matters to which I have given special attention, I feel bound to point them out. Coming from such an important authority as Dr. Hermann Müller, one cannot but feel that they would be likely to be accepted, and might be made the foundation of many erratic conclusions.

St. Ann's, Mount Hermon, Woking:
January 13th, 1888.

DESCRIPTIONS OF SOME NEW SPECIES OF *MICRO-LEPIDOPTERA* FROM ALGERIA.

BY GEORGE T. BAKER, F.L.S.

CONCHYLIS LAMBESSANA, *n. sp.*

Alæ anticæ albidæ, ad basim fuscæ, vittis duabus obliquis fuscis vitta media ad marginem inferiorem attingente, vitta posteriore, angustiore et breviore; ciliis albidis tessellatis; alæ posticæ argenteo-cinereæ; ciliis albidis.

The anterior wings are white, with an irregular patch of fawn-brown at the base, and a broad oblique median stripe of the same colour extending from the costa to the inner margin. This is followed by another narrower brown stripe near the posterior margin, which does not touch the inner border. The white ground colour between is also somewhat mottled with brown. Just in front of the apex are two pale brown spots, and the hind margin is also dotted with the same hue. The fringes are white intersected with brown, and with a dark dividing line.

The posterior-wings are silvery-grey, slightly brownish by the hind margin, the white fringes (having a somewhat indistinct dividing line) are edged with very pale brown at the apex. Expanse, 16½ mm.

I have one specimen of this pretty species, taken at Lambessa.

NEMOTOIS CONSTANTINELLA, *n. sp.*

Alæ anticæ aureæ, cum ciliis coloris ejusdem ; alæ posticæ albidæ hyalinæ linea marginali fusca ; ciliis albidis.

The anterior wings are of an uniform golden-bronze, inclining to a coppery tint towards the posterior margin.

The posterior wings are of a transparent white, with the apex greyish, the posterior margin being bordered by a fine brown line. Fringes whitish.

Expanse, 14 mm.

This is somewhat nearly allied to *prodigellus*, but may at once be recognised by its larger size, and by the bronze being of a paler or greener hue. I have two specimens from Lambessa.

GELECHIA ALGERIELLA, *n. sp.*

Alæ anticæ angustæ fusco-cinereæ strigis duabus centralibus minutissimis nigris ; ciliis cinereis ; alæ posticæ ciliaque cinereæ.

Anterior wings warm brownish-grey, with the apical portion thickly covered with pale ash-grey scales, interspersed with a few black scales. There is a small dark central dash just on the fold, followed posteriorly by another somewhat nearer the costa, between which spots are more pale ash-grey scales. Fringes grey, with a dark dividing line, extending from the apex for half the length of the fringe.

Posterior wings grey, deeply emarginate beneath the apex, with fringes of the same hue.

In the ♀ the two small dark dashes are quite obsolete, and the grey scaling is very slight indeed.

Antennæ dark grey, head and thorax same hue as fore-wings. Palpi grey in ♂, very pale in ♀, the head is also much paler in the ♀. Legs unicolorous, pale greyish-brown, the fore-legs being decidedly the darkest.

Expanse, ♂, 20, ♀, 21½ mm.

I have two ♂ and one ♀, all of which were captured at Lambessa.

CLEODORA CONSTANTINA, *n. sp.*

Alæ antice cinereo fuscæ, strigis tribus nigris, albo marginatis, striga centrali majore obliqua ; alæ posticæ cinereo-fuscæ, ciliis pallidioribus.

Anterior wings greyish-brown, with a small dark central dash in a white streak, followed by a small dark dash in a white streak, which is again followed posteriorly by an indistinct dark dot surrounded with white near the costa. These white markings form a sort of broken, oblique, whitish shading from just in front of the apex to the centre of the wing. Immediately before the apex, which is strongly bordered with black, are two very short, oblique, parallel lines. The fringes are dark brown at the apex, becoming whitish at the anal angle, and being tessellated with white.

The posterior wings are darkish grey, deeply emarginate beneath the apex, with paler fringes. Head, collar and palpi (the latter being slightly tipped with grey) white. Thorax and abdomen as anterior wings. Expanse, 16—17 mm.

This species is somewhat nearly allied to *anthemidella*, but may be distinguished from it by the decidedly darker and browner hue of the fore-wings. The hind-wings are also more deeply emarginate beneath the apex; also the oblique white stripe from the costa to the hind margin below the apex, usually so distinct in *anthemidella*, is quite wanting in my insect.

I have two specimens, both from Lambessa.

COLEOPHORA PECHI, *n. sp.*

Alæ anticæ ciliaque ochreæ; cum venis pallidioribus; alæ posticæ ciliaque fusco-cinereæ.

Anterior wings uniformly ochreous, with all the neuration mapped out in a paler hue of the same colour. Fringes ochreous, with a darker patch on the apex.

Posterior wings dark grey, with fringes of the same colour. Head, palpi and thorax same hue as the fore-wings, abdomen as hind-wings, with the anal extremity fulvous. The legs are all slightly ochreous. Expanse, 16 mm.

I regret that I have no case with the only specimen sent me, which was also taken at Lambessa.

COLEOPHORA DUBIELLA, *n. sp.*

Alæ anticæ albo-margaritaceæ, striga fusco-ochracea e basi oriente, prope medium fissa, ramo superiore, majore, ad apicem currente, inferiore tantum ad angulum analem margine interiore fusco-ochraceo; alæ posticæ ciliæque hyalinæ cinereæ.

Anterior wings pearly-white, with a broad, central, longitudinal stripe of ochreous-brown, branched beyond the centre, the upper one extending to the apex, and the lower to the anal angle, the inner margin is broadly bordered with ochreous, except at the base. Fringes brown at the apex, shading rapidly into pale grey at the anal angle.

Posterior wings lustrous-grey, with fringes of the same colour. Head, face and thorax pure white, antennæ white, annulated with black, palpi slightly greyish, abdomen fuscus, with whitish legs and tarsi. Expanse, 19—20 mm.

The pistol-shaped case is brownish-white, becoming blackish towards the head. This is enclosed within two beautiful nautilus-shaped lateral covers of a strongly shagreened silky texture, of a greyish hue, becoming brownish near the head. I have three specimens from Lambessa.

This species is somewhat nearly allied to *solenella*, but may be readily recognised by its larger size, decidedly darker brown, and by the white colour being less silvery. The case is also very different, that of *solenella* being of a uniform reddish-brown hue, almost straight, and half as long again as in my species.

16, Clarendon Road, Edgbaston:
January 26*th*, 1888.

P.S.—Since writing the above, I have, through the kindness of Dr. Staudinger, been enabled to compare my *Coleophora dubiella* with the type of his *squamosella*, to which it is closely allied, the shape of the cases being somewhat similar. The shape of the lateral covers of *squamosella* is, however, straighter (not nautilus-shaped), much less roughly shagreened, and whiter in colour. The interior case is also straighter. The imago is easily recognisable, my species being larger, decidedly darker and browner, and the white colour is very much less silvery.

Dr. Staudinger informs me that my insect feeds on a species of *Artemisia*.—*March* 16*th*.

THE EGG AND YOUNG LARVA OF *ANTHOCHARIS CARDAMINES*.

BY T. A. CHAPMAN, M.D.

In 1886 White Butterflies were very scarce, and it so happened that any white butterfly that I saw in May and June proved to be a ♀ *cardamines*. *P. rapæ* was so scarce that I could not obtain any eggs for comparison with those of *cardamines*, and I had to wait till 1887 in order to do so.

In June I observed the ♀ of *cardamines* settling on the flowers of *Alliaria officinalis* ("Jack-in-the-hedge," or, garlic mustard), and saw it occasionally deposit an egg as well as sip the honey. At the date when this occurs there is usually about an inch of the stem occupied by seed pods already formed, and the pedicel selected for the egg is usually that of a flower nearly over, so that it might equally be called a young pod, the guide used by the butterfly is obviously such a portion of the stem or pedicel as she can conveniently reach, whilst her proboscis also reaches the open flowers. Only one egg is laid on one head, if a second be found, it is the result of the visit of another butterfly. The *Alliaria* grows in patches or colonies, and each such colony usually presented one head of blossom containing an egg, though there were exceptions of some colonies being uninhabited, and others presenting several eggs. A large patch of *Alliaria* did not afford a second egg more frequently than a small one. These statements might, no doubt, have to be modified according to the abundance of the butterfly in different seasons, but it would remain true that each butterfly lays her eggs solitarily and distributes them over a wide area.

The *Alliaria* is undoubtedly *the* food-plant of *cardamines* in this district; I have found the eggs on turnips and charlock, but these and the other *Cruciferæ* it may affect are exceptional.

The egg is very like that of *P. rapæ*, but is larger and darker; both are of the inverted vase shape, common in the *Pieridæ*. In *cardamines* the height of the egg is 1·10 mm., the greatest diameter, ·52 mm., the longitudinal ribs are thirteen in number, several coalescing towards the top, so that the rosette at top has ten or eleven rays. The colour, when first laid, is very pale pearly-green, almost white, getting darker and passing through yellow to deep orange or almost brown. *Rapæ* (always laid on a leaf) is ·90 mm. in height, ·41 mm. in diameter, has eleven ribs uniting into about seven at top. The colour is rather greener, passing quickly into yellow and never darker than a pale yellow. The bright orange colour makes the eggs of *cardamines* very conspicuous amongst white flowers and green stems of the *Alliaria*, so that they are easily found.

It hatches on the eighth day, there is little doubt this period will vary with the temperature. The larva takes from sixteen to twenty-four days to feed up, the shorter period being that of a larva hatched June 30th, and fed, therefore, during July. A still larger period is probably the rule with larvæ hatched early in May, as must often happen. The following are the dates of moulting in two instances:—

Hatched	June 26th	June 30th.
1st Moult	„ 30th	July 3rd.
2nd „	July 2nd	„ 5th.
3rd „	„ 5th	„ 8th.
4th „	„ 7th	„ 11th.
Change to pupa	„ 12th	„ 19th.

The newly-hatched larva attacks a small pod just below the stigma, as it gets older it is less particular, but always feeds on the pods and their contained seeds; I never saw one touch a leaf. It has the ordinary trapezoidal subdorsal and lateral tubercles. In subsequent skins these gradually subside as the seven sub-segments become more distinct with their rows of tubercular dots, until, in the last skin, the typical tubercles cannot be very certainly distinguished from the secondary dots. The hairs of the typical tubercles and, to a less extent, of the secondary dots in the second and third skins, are tipped with globules of fluid. Similar globules may be detected on the hairs of the young larvæ of *rapæ* and *brassicæ*, but in *cardamines* they are much larger and more conspicuous, so that no doubt of the nature of the club at the end of each hair is possible, especially as they are shortly renewed if wiped off. They are proportionately largest in the youngest larva in its first skin, but are more numerous in the second, and still more in the third, as the secondary dots develop, and here they are proportionately larger on the hairs of the tubercles proper than on those of the dots. I have no theory to suggest as to the object and use of this curious provision.

Burghill, Hereford:
February, 1888.

DESCRIPTION OF A NEW GENUS AND SPECIES OF *LYCÆNIDÆ*.

BY HAMILTON H. DRUCE, F.E.S.

PSEUDALETIS, *n. g.*

Allied to *Spindasis*, but the fore-wings much less triangular and considerably longer, and the hind-wings much more produced at the apex. Head smaller. Antennæ rather short, gradually thickening towards the end, while in *Spindasis* they are distinctly clubbed. Palpi exceedingly minute, and densely clothed with scales. Abdomen robust, with a thick tuft of hair at the anus. Neuration as *Spindasis*.

Type: *Pseudaletis Agrippina.*

The species described by me as *Spindasis Clymenus* will come into this genus.

PSEUDALETIS AGRIPPINA, *n. sp.*

♀. *Upper-side*—Primaries and secondaries bright orange-red, rather broadly bordered (except along the costal margin) with black, containing an irregular marginal row of pure white spots.

Primaries: costal margin narrowly bordered with black, darkest at the base; at the apex are three gradually decreasing pure white spots, followed by two much smaller and again by a large spot at the posterior angle. Secondaries with three marginal white spots at the apex, followed by two smaller and again by a larger spot between the last median nervule and the sub-median nervure, beyond which, at the anal angle, there is a broad white patch extending to the orange, with the inner half rather thickly covered with long black hairs. There are also two short black tails.

Under-side as above, excepting that the black border so distinct on the upper-side is wanting, and that inside the rows of spots at the apices and anal angles of both wings there are rows of smaller white spots running parallel. The base of the fore-wing between the costa and the costal nervure is distinctly white. Head, palpi and thorax orange-yellow; legs brownish. Abdomen black, ringed with white, and a large buff coloured anal tuft. Expanse of wings, 2¼ inches.

Hab.: West Africa, Cameroon Mountains. Mus. Druce.

This fine species bears a close resemblance to *Aletis helcita*, L. (which occurs at the same place), it appears to be very rare, as amongst the enormous number of butterflies received from the Cameroons it does not seem to have been noticed before.

London: *March*, 1888.

NEPTICULA SERELLA, N. SP.

BY H. T. STAINTON, F.R.S.

Sero nunquam est ad bonos mores via is a sentence which one learnt many, many years ago; perhaps, if "the way to good manners is never too late," it may be never too late to describe a new species, however long one may have had a specimen.

The subject of the present notice was found in the larva state as far back as 1859, and the imago appeared in 1860, but till quite recently I had only seen that single specimen.

Now, through the kindness of Mr. I. H. Threlfall and Mr. P. B. Mason, I have had three other specimens simultaneously before me, and no longer hesitate to give my aged specimen a name.

All these three specimens were bred by Mr. Threlfall from larvæ found in *Potentilla tormentilla*, on the moors of Westmoreland (see *ante*, p. 186).

Exp. al., 2 lines.

Head dull dark ferruginous, with a still darker central spot.

Anterior-wings with the basal portion of a uniform glossy golden-brown, beyond the middle is a nearly straight, moderately broad, pale golden fascia, apical portion of the wing very dark purple, almost black, with the cilia (which have no dividing line) slightly paler.

My original specimen was bred from a larva found on Birnam Hill, near Dunkeld, September 11th, 1859; the imago appeared in July, 1860.

The continental *N. tormentillella*, of which I have several bred specimens, has narrower anterior-wings, with the basal portion bronzy-green, and a purple band before the metallic fascia, which is rather silvery than pale golden, the apical portion of the wing purple, but not nearly so dark as in *N. serella*; head black.

Mountsfield, Lewisham:
March 20th, 1888.

White Butterflies in Japan.—My September number of the Magazine is just to hand, conveying the intelligence of great swarms of "Whites" in England last year. Now the *Pieridæ* are great favourites of mine, and I am always on the look out for anything concerning this group, and have therefore read with much interest all that has been written upon this "inundation," and will give a few notes of my own.

1886 was the great "White" year in Japan. *Pieris napi* was very abundant, but *Pieris rapæ* swarmed. I first noticed great quantities of the latter while travelling from Yokohama to Tokyo early in May. All along the line are fields of rape and radish, which were swarming with *Pieris rapæ*, the train disturbing those on the embankments until we seemed to be accompanied from station to station by a little fluttering white cloud. Shortly after this I left Yokohama for the Ryukyu Islands, and next had my attention attracted by the "White" in the Bay of Kagoshima. This was my first visit to Satsuma, and I was therefore on deck before sunrise, anxious to see this most beautiful Bay. As the sun gained power I first noticed solitary specimens of *Pieris rapæ* slowly drifting down the Bay in a southerly direction; as the morning advanced there were hundreds all going to the same quarter before a light breeze which barely ruffled the surface of the water. I had plenty of time for observation, as when we reached Kagoshima before noon, the Port Officials politely but firmly insisted upon our remaining in quarantine for twenty-four hours, and all that day, until between 3 and 4 p.m., when they ceased, the flight was going on. The only other butterfly seen was a fine specimen of *Papilio Machaon*, which flew about the steamer until captured. After leaving the Bay the next day not a single "White" was to be seen. There were none on Amami Ohoshima where I landed, nor on Okinawa where I collected for three days. I left my collector on that Island, and he remained for some months, with orders to take everything; among the specimens (some thousands) there was not a single specimen of a White!

Now, notwithstanding that I saw the "Whites" apparently "migrating" in the most approved fashion, in thousands, I do not for a moment suppose that the "migration theory" accounts for the superabundant appearance of this or any other species, either in Japan or England. In the first place, there is no evidence or reason to suppose that the swarms seen at Yokohama and Kagoshima had migrated there from anywhere else; and secondly, it is quite incredible that had the swarm seen at Kagoshima been capable of migrating even in a limited acceptation of the term, that not a single specimen should have been seen on the adjacent Ryukyu.

I believe that Mr. Jenner's remarks (Ent. Mo. Mag , xxiv, p. 113) sum up the whole mystery. Butterflies multiply so rapidly, that the produce of a few pairs exceptionally favoured by circumstances is sufficient to account for the wholesale appearance of any species either the same season or the next. I have had a very good instance of this during the past autumn and early winter. We have in Japan eleven species of *Vanessidæ*, ten of these are abundant, one (*Vanessa cardui*) is scarce, and until this year I had only a few specimens, taken singly, at various localities; but this season it was abundant for the first time during seventeen years, and I could have taken hundreds. This season has been extraordinarily mild, resulting in an extra brood, hence its abundance.—H. Pryer, Yokohama: *January 19th*, 1888.

Rhyacophila munda in West-Central France.—In a box of *Trichoptera* just received from my esteemed correspondent M. René Martin of Le Blanc (Indre), I find a single ♂ example of this insect, which thus loses its claim to be peculiarly British. It was described by me in 1862 in the Trans. Ent. Soc. Lond., ser. 3, vol. i, p. 309, from examples found in 1861 at the streams in South Devon originating on Dartmoor, where I have since taken it on several occasions. In September, 1863, I found it, in company with *Rh. obliterata*, in certain localities in North Wales. These localities represented the extent of its known distribution. I could hardly imagine it really was peculiarly British ; nevertheless, during more than a quarter of a century no one had recorded it on the continent, nor, until now, have I ever seen an example in the multitudinous collections from all parts of continental Europe forwarded for examination during that period. And it is a species with special structure so remarkable as to constitute a distinct group of the genus. If once again our insular *amour propre* has been wounded in no longer being able to claim a certain species as peculiar to our country, there is more than sufficient compensation in the addition gained to the knowledge of its distribution ; personally, I rejoice ; it is what I hoped for, and what I felt sure *must* happen some day. But I had looked for the record from some locality (probably in Britanny) further north than Le Blanc. Who is there that collects *Trichoptera* in Britanny ?

M. Martin is located in a wonderfully rich (and peculiar) district. On the one hand he finds certain species there formerly known only from Portugal ; on the other he is able to take from us the exclusive right to almost the only Trichopteron we could claim as distinctly British. He also finds *Rhyacophila Pascoei*, McLach., in his district, but that, although unique a few years ago, has proved to be wide spread ; even the Seine at Paris produces it.—R. McLachlan, Lewisham, London : *February 25th*, 1888.

Review.

An Account of the Insects Noxious to Agriculture and Plants in New Zealand: The Scale-Insects (Coccididæ). By W. M. Maskell, F.R.M.S., Registrar of the University of New Zealand. Wellington : By authority : G. Didsbury, Government Printer. 1887. 23 plates, pp. 1—116. 8vo.

This work consists of a revised collection, in classified order, of the descriptive papers on *Coccidæ*, which have been contributed by the author during several years to the "Transactions of the New Zealand Institute." Now summarized and brought into a compendious form, this volume will doubtless prove useful to the persons for whom it is primarily intended—the cultivators whose trees and plants often suffer greatly from the attacks of *Coccids*,—by teaching them the nature of the insects, and the best methods of destroying them ; and it has also a general scientific value in the masterly way in which the subject is treated from an entomological point of view. The primary groups, the genera of the whole world, as well as the species indigenous to, or introduced into, New Zealand, are concisely differentiated and described. The excellent figures, well lithographed from the author's drawings, those of the perfect insects being coloured, efficiently realize the wonderful forms, and are particularly illustrative and interesting to residents in other countries, of the genera *Lecanochiton*, *Ctenochiton*, *Inglisia*, *Eriochiton*, and *Cœlostoma*, all hitherto special to N. Zealand ; there is also a full-page plate of the notorious *Icerya*

Purchasi, which is supposed to have been introduced from Australia, but is now a dreadful pest on all kinds of plants in N. Zealand; in Auckland it has destroyed whole orchards of orange and lemon trees. It has also done immense damage in Australia, South Africa, and California, and as it might readily be introduced into this country, and prove very destructive to plants under glass, cultivators should be warned to watch for its advent, for then only, in view of what Professor Riley terms "its alarming prolificacy," could effectual means be adopted to prevent its spread in this country. The best means of enabling horticulturists generally to identify the insect would be to put them in possession of this book of Mr. Maskell, and the "Report for 1886," of Prof. Riley, noticed in our number for December last, p. 161.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY: *February 23rd*, 1888.—T. R. BILLUPS, Esq., F.E.S., President, in the Chair.

Mr. Routledge exhibited a number of preserved Lepidopterous larvæ. The Secretary read "Notes on the *Geodephaga* in Ireland," contributed by the Rev. W. F. Johnson, of Armagh. The author said the number of species of *Geodephaga* at present known to occur in Ireland was only some 140, out of the three hundred and odd species in the British List. This apparent disproportion of numbers arose from the fact that Ireland had never been properly worked for *Coleoptera*; consequently, it might reasonably be supposed that a more thorough investigation would raise the number in the present list very considerably. That such an undertaking would be amply rewarded might be gathered from the fact that he had single-handed taken in the Armagh district in the four years since he began to work at the *Coleoptera* upwards of 76 species of *Geodephaga*, many of which had not been previously recorded as Irish. A list of the species captured, with observations thereon, followed; and, in conclusion, the author said he could not regard the list with anything like satisfaction. It was only a beginning, and would serve to show where the gaps were, and what remained to be done. He, however, felt sure that if the south and west, the sea coasts and the mountains, were searched by earnest workers, not only would most of the gaps in the present list be filled, but probably many new species would be added to the *Coleoptera* of the British Isles. An exhibition of microscopical objects was then given: Messrs. Dadswell, Terry, Macer, Coombs, Shaw, Turner, Adkin, West, Tutt, and Medland, exhibiting.

March 8th, 1888.—The President in the Chair.

Messrs. H. Robson and H. A. Auld were elected Members.

Mr. R. Adkin exhibited a variety of *Eubolia bipunctaria*, Schiff.: the whole of the ground-colour of the fore-wings being black, the whitish-grey basal patch and central fascia, on which latter the usual central spots were very prominent, being the only markings visible, and having correspondingly dark hind-wings; the specimen was taken by Mr. O. Danenberg, at Boxhill, July, 1886. Mr. C. H. Watson, a variety of *Phibalapteryx tersata*, W. V., from New Forest, 1887. A note was read by the Secretary from Mr. T. D. A. Cockerell, on the origin of *Gonepteryx Cleopatra* L., which, in his opinion, arose as a seasonal variation; *Colias Eurytheme*, of Boisduval, generally distributed throughout the States, had on the fore-wings an orange patch on a yellow ground, precisely similar to that of *G. Cleopatra*: there was, however, a seasonal form, *Keewaydin*, Edwards, which emerged from hibernated pupæ, and had the orange patch much reduced. The seasons in America being very marked, the summer and winter types must necessarily alternate, but supposing the Northern States to become uniformly cold, the Southern uniformly warm, what would happen? Was it not obvious that the winter form of *C. Eurytheme* would be perpetuated in the north, while the summer form would be prevalent in the south? A further note from Mr. Cockerell was also read with regard to *Agrotis suffusa*, Hüb., which he said was abundant in America.—H. W. BARKER, *Hon. Secretary.*

ENTOMOLOGICAL SOCIETY OF LONDON: *March 7th*, 1888.—Dr. DAVID SHARP, F.Z.S., President, in the Chair.

Mr. Frederic Pennington, Jun., of Broome Hall, Holmwood, Surrey; Mr. W. Crush, of Westcombe Park, Blackheath, S.E.; and Mr. J. P. Cregoe, of Charleston, U.S.A., were elected Fellows.

Mr. J. H. Leech exhibited, and made remarks on, a number of butterflies forming part of the collection made for him during last summer by Mr. Pratt, at Kiukiang, Central China. The specimens exhibited included *Papilio macilentus* (hitherto only recorded from Japan), varieties of *P. Sarpedon*, and a supposed new species of *Papilio*; a series of *Sericinus Telamon; Acræa Vesta* (varieties); *Charaxes Narcæus*, and var. *mandarinus* (the latter being the common form at Kiukiang); *Palæonympha opalina*, Butl.; new or unknown species of *Lethe*, *Apatura*, and *Neptis*; and a series of *Argynnis Paphia*, with the var. *Valezina* of the female. Mr. Leech stated that all the females of *A. Paphia* taken at Kiukiang belonged to the var. *Valezina*, the typical form of the species being unknown there.

Mr. Poulton expressed his interest in Mr. Leech's statement that *Valezina* was the only form of the female of *Argynnis Paphia* known at Kiukiang, and said he considered this fact would probably throw a new light on the question of the dimorphism of the species.

Mr. Jenner Weir said he had in the course of years obtained a series of forms intermediate between the typical female and the variety *Valezina*. Mr. McLachlan, Dr. Sharp, and Mr. Leech continued the discussion.

Mr. Champion exhibited, for Mr. J. J. Walker, R.N., about 950 species of *Coleoptera*, recently collected by the latter near Gibraltar. Mr. McLachlan called attention to the large number of water-beetles included in Mr. Walker's collection. Mr. Kirby suggested that the attention of the Imperial Institute should be called to the interest attaching to the exhibition of local collections of insects from British Colonies and possessions.

Mr. Verrall exhibited living specimens of *Aspidomorpha sanctæ-crucis*, and another species unnamed, from the caves of Elephanta.

Mr. Slater exhibited specimens of a species of weevil which had been doing much damage to maize sent to the Colonial Exhibition.

Mr. W. White read a paper on "Experiments upon the Colour-relation between the pupæ of *Pieris rapæ*, and their immediate surroundings," which comprised a detailed account and discussion of a series of observations carried on at the author's instigation by Mr. G. C. Griffiths, of Bristol. The various experiments were intended to act as a further test of the conclusions arrived at by Mr. E. B. Poulton in his paper on the subject in the Transactions of the Royal Society; and to effect this object, different and additional influences had been brought to bear on these pupæ, so that an analogy might be drawn between the two sets of results.

Mr. Poulton, Lord Walsingham, Mr. Jacoby, Dr. Sharp, Mr. White, and others took part in the discussion which ensued.—H. GOSS, *Hon. Secretary.*

DESCRIPTION OF A NEW SPECIES OF *ALEURODES.*

BY J. W. DOUGLAS, F.E.S.

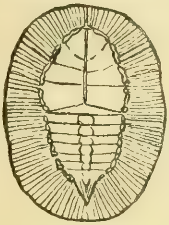
ALEURODES RIBIUM.

Head, thorax and abdomen yellow; antennæ and legs pale; wings milk-white, immaculate. Eyes black, elongate, sub-reniform, ends broadly rounded, contracted on both sides to the middle, and there crossed by a white farinaceous fillet, each portion viewed from beneath with seven straight, transverse rows of distinct white atoms. Antennæ of seven joints; 1st very short; 2nd stout, bulbous, almost obconic, the end hollowed out; the others thin; 3rd longer than 2nd, cylindric; 4th to 6th somewhat shorter, sub-equal; 7th longer, pointed.

Expanse of wings, 2·60—2·75 mm.

Larva short broad-oval, flat, shining, at first pale green, afterwards pale citron-yellow, without hairs; sides sloping upwards and inwards from the circumference to an oval ring, smaller than but parallel to the circumference, the edge of the ring set with a catenulated series of small, obtuse elevations; within the ring, on a flattened surface, is a dim outline, in slight relief, of the back of the insect beneath the integument, with segmental indications, and on the median line of the abdomen four or five small obtuse elevations; the sloped sides with close, delicate, transverse striæ.

Length, 1·5, breadth, 1 mm.



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The imago, except as to the dotted eyes, as noted above (a structure that, although not recorded, may possibly exist in other species, and be visible only in fresh examples), presents nothing remarkable, the best specific characters, as usual in the genus, being demonstrated in the larva. I believe that before winter the larvæ had passed into the pupa state, of which, as is well known there is, in this genus, scarcely an outward and visible sign, but in this species, in the adult larval state the outline of the insect below the integument is more strongly defined in the thoracic region, and there are mostly dark, suffused spots there and on the sides posteriorly, which character disappears in the pupa.

The number of joints in the antennæ of the imago, even of the same species, has been variously stated by different authors, of which I subjoin some examples.

A. proletella, Linn. (*chelidonii*, Latr.), Latreille (Gen. Crust. et Ins., iii, 174, 1, and Règne Anim., iv, 188, pl. 69, fig. 16), six joints. Burmeister (Handb., ii, 1, p. 82), six joints, 2nd very long, 3—5 equal lengths; his figure pl. 2, fig. 7, represents joint 1 as very short, 2 very long, nearly half the length of the antenna, 3—5 nearly equal, 6 longer than 3. Heeger (Sitzungsber. d. k. k. Akad. d. Wissens., 1855, xviii, 35) remarks that Burmeister has probably overlooked the small, distinctly separated basal joint. Westwood (Intr. Mod. Class. Ins., ii, 442), six joints, but his fig. 118, 3, shows seven joints. Amyot and Serville (Hémipt., 614), six joints. Signoret (Ann. Soc. Ent. France, 4 Ser., t. viii, 377), seven joints, 1 very short, 2 larger, globose, three following almost filiform, 3rd longest, contracted a little in the middle, 3, 5, 6 and 7 sub-equal, together scarcely longer than 3. Signoret gives seven joints as a normal generic character.

A. aceris, Geoffr., Bouché (Stett. ent. Zeit., xii, 109), ♂, ten joints, 1 and 2 almost spherical, 3 longish and thicker, 4 thin, as long as the first three together, 5 shorter, 6 thin, longer than 4, the remainder oblong, shorter, in length sub-equal: ♀, nine joints of like proportions. Signoret (*op. cit.*, p. 394), seven joints, 1 short, globose, 2 twice as long, clavate, 3 two and a half times as long as 2, nearly as long as the last four, undulated, very small at its base, afterwards thicker; 4 and 7 of equal length and shortest; 5 and 6 of equal length, and a little longer than 4 and 7; 5 globose at the extremity; the last five circularly striate.

A. asarumis, Shimer (Trans. Amer. Ento. Soc., i, 281), six joints, 1st thick, clavate.

Koch (Pflanzenläuse, p. 324) describes four species: *chelidonii*, Latr.; *brassicæ*, Koch; *carpini*, Koch; *lonicera*, Koch; all as having six joints in the antennæ; but on pl. 54, figs. 393, 394, 395 and 396 all four have seven joints. He says of *A. loniceræ*, "Das vierte Glied der Fühler in drei Gelenke abgetheilt."

Signoret (*op. cit.*, p. 381) remarks, respecting the intercalary joints of the antennæ, "As to the 4th joint of the antennæ being divided into several, it is a fact that this is seen more or less in all the joints of the antennæ of the species of this genus, and is more or less visible according to the aspect examined." This is doubtless the key to the discrepancies exhibited in the descriptions and figures of more than the normal seven joints that I have referred to; where only six joints are recorded, I must believe that the basal joint has been regarded as an antenniferous process. It must, however, be admitted that in consequence of the farinosity, the intercalary joints, and the transverse striation (which is very evident under a high power), the recognition of the normal number of articulations is very difficult; yet I believe I have given those of this species correctly.

In September, 1886, I saw some larvæ of an *Aleurodes* attached to the under-side of the leaves of black and red currant bushes (*Ribes nigrum* and *rubrum*), and as they did not agree with any description, I concluded they were a new species; but to be sure, I sent some to Dr. Franz Löw, Vienna, and he confirmed my belief. I had hoped that the imago would appear before or in October, but the larvæ remained on the leaves, and fell with them late in October. I then gathered a quantity and put them into an open plant pot, where they remained exposed to the weather all the winter. I also put some five or six into a gauze-covered glass and kept indoors, and I gummed a dozen on to card. Of the latter one became an imago in about a week; one only of those in the glass was transformed in February. At the end of April I sent a few of those kept out of doors to Dr.

Löw, and he obtained from them seven perfect insects in May. Of the remainder that I had kept out of doors, two only developed on June 6th, but no more came out, and it was not until June 30th and during the following week that I saw a few on the currant trees in the garden. The wonder is that there were any, for after I had gathered up the fallen leaves there were two or three days of continuous rain, and then no more leaves were to be seen, for all that had remained had been buried by worms, and the adherent insects with them. Such are the chances and changes of their life; this season has not been more propitious, for very few larvæ have appeared, and I also may have helped to thin the race.

8, Beaufort Gardens, Lewisham:
October 22nd, 1887.

NOTES ON SOME NORWEGIAN *CRAMBI.*

BY G. T. BAKER, F.L.S.

When my friend Dr. Jordan was in Norway last autumn, and in the summer of 1885, he made some interesting captures among the *Crambi*, all of which he was good enough to give me; and as, comparatively speaking, but little is known of the Scandanavian insect fauna, amongst the majority of the British entomologists, it may be well to give a list of all he took of this genus.

Crambus cerussellus, Schif.—One ♀ was taken at Trondhjem, on July 6th.

C. alienellus, Zk.—Several of this species were taken in one of the marshy tracts at Koppang during the first week of July; one very dark specimen with scarcely a trace of the white inner margin is worthy of note. The nearest British allies to *alienellus* are *hamellus* and *dumetellus*, between which, with several intermediate species, Dr. Wocke places it, in his and Staudinger's catalogue. I append a short description of it:—

Olive-brown, occasionally with a slight golden lustre, with a narrow white longitudinal stripe, distinctly toothed somewhat beyond the middle, followed by a small white blotch. The longitudinal stripe does not reach quite so near the costa as in *dumetellus*. Just in front of the hind margin is the usual angled, oblique, shining, lead-coloured line, from the costa to the inner margin, which inner margin is whitish, once intersected with brown near the centre. The hind-wings are brownish-grey.

C. pratellus, L.—Common everywhere, and some very dark and silvery-streaked forms occurred, one being so much streaked, and having no more than a trace of the usual longitudinal white stripe that I think it must be a hybrid between *pratellus* and *hortuellus*.

C. dumetellus, Hb.—Several fine specimens occurred at Elverum in the first week of July, they are brighter than most of my continental specimens, with, perhaps, the exception of one or two examples which I took at Chamounix. I notice a curious circumstance with this insect: all my English specimens, from the New Forest and the south of England, are much brighter and more golden in colour than any continental ones, whilst some eight or nine Scotch examples from Rannoch revert to the duller hue.

C. hortuellus, Hb.—This was also abundant everywhere, some of the ♂ being unusually dark; there are also one or two specimens approaching the Lapland variety, *montanellus*, so closely that it is scarcely possible to distinguish them.

C. truncatellus, Zett.—Dr. Jordan had the good fortune to take one of this fine species at Tuset on July 9th. It has no near ally among our *Crambi*; the following description may, therefore, be useful:—

Ground-colour greyish, with two oblique rust-brown stripes from the costa to the inner margin, the posterior one dentated. The hind margin is broadly bordered with rust-brown, and the costa is also browner than the inner margin. Fringes brown, tessellated with white. Hind-wings darker grey.

My Norway specimen is much darker and uniformly browner than those I have from Lapland; the two oblique stripes are also somewhat obliterated. This *Crambus* has, I believe, only been hitherto recorded from Lapland, Finland, and Livonia. Herr A. Bang-Haas tells me that Dr. Staudinger and he have never received it from Norway, so that this is probably a new locality for it.

C. falsellus, Schiff.—Faleida; end of August.

C. myellus, Hb.—Ormein (Romsdal); end of August. One specimen of this local and widely dispersed insect occurred.

C. furcatellus, Zett.—This was taken rarely at Jerkin, during the second week in July; the specimens do not vary from the typical form.

C. culmellus, L. S. N.—This was also abundant everywhere, and is of the typical form.

C. tristellus, S. V.—The ordinary form occurred at Faleida at the end of August.

C. perlellus, Sc.—Dr. Jordan took only one specimen at Christiania, which is also of the ordinary silvery form.

16, Clarendon Road, Edgbaston:
February 7th, 1888.

ON THE KNOT-HORN LARVA WHICH INFESTS THE CONES OF SPRUCE FIR.

BY H. T. STAINTON, F.R.S.

Since the publication of Mr. Atmore's notes on the larva of *Nephopteryx abietella*, which he met with burrowing in old and young shoots of Scotch fir (*Pinus sylvestris*) in the spring, my attention has been called by Mr. C. G. Barrett to a larva found in the cones of spruce fir (*Pinus abies* or *Abies excelsa*) in the autumn, which he had supposed to be that of *Nephopteryx abietella*.

The perfect insects bred by Dr. Wood certainly seem to be referable to the *splendidella*, H.-S. (the name now adopted by M. Ragonot, Ent. Mo. Mag , vol. xxiv, p. 224, for the *sylvestrella* of his Revision, Ent. Mo. Mag., vol. xxii, p. 52) ; as probably this insect is still in very few of our collections,* I have thought it desirable to publish the following extracts from the note books of the late W. Buckler, so as to call attention more emphatically to this insect and its curious habits.

NOTES ON *PHYCIS ABIETELLA* FROM MR. W. BUCKLER'S NOTE BOOKS.

On August 16th, 1874, I received from Mr. John H. Wood a spruce fir cone containing a larva, whose ravages were plainly perceptible by the extruded particles of light fawn coloured frass from some of the scales, which still adhered by a thread or two of silk to the cone. It was not till the 26th that I was able to secure this individual to figure and describe, although on two previous occasions I obtained a transient glimpse of it as it left one part of the cone and entered another part ; but on this occasion I caught it on the calico cover of the glass vessel that contained the cone, and then took the following description :—

Larva, when stretched out, is just half an inch in length, rather slender in proportion, stoutest at the thoracic segments, the others a little less but tolerably uniform in width to the twelfth, whence it tapered a little to the extremity of the thirteenth, which was rounded ; the head a little flattened, rather broad, but not so broad as the second segment, which is equal in length and breadth to the third and fourth, the transverse wrinkles on these being rather deep, while on the others, one moderately deep, followed by a fainter one, sub-divides each of them at about two-thirds from the beginning ; anterior legs well developed, the ventral and anal ones moderately and much under the body.

The head is shining and of a pitchy blackness, above paler on the top of the lobes and brown beneath ; a broad, black, shining, semicircular plate is on the second segment, the skin of the body is without gloss, and of a rich reddish- (rather chocolate-) brown colour above on the back and sides, becoming a little paler on the belly ; on the sides at the segmental divisions the skin appears paler, of a greyish glistening tint, seen only when the larva is fully stretched out ; the tubercular dots are small, black, and shining, each emitting a fine and longish hair ; spiracles round,

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* Mr. P. B. Mason has specimens of *splendidella* which are undoubtedly British, but of which the localities are not known. They were obtained from the collection of the late Mr. Edwin Brown, of Burton-on-Trent, and other reliable sources.

very minute, of ground colour, faintly outlined with black; a pale faint patch of ochreous is on the back of the twelfth segment, and on the thirteenth it is paler still, and has there a dark brown sub-dorsal stripe, and the surface is shining.

In the sub-dorsal regions of the 3rd and 12th segments is an ocellated spot of greyish or whitish-grey, with black centre, bearing a hair.

Another larva left its cone full fed on September 22nd. The length, when stretched out, three-quarters of an inch, its body one-eighth of an inch in diameter. Its colour on back and sides is rather a bronzy-brown, the belly and lower part of sides rather paler pinkish-brown; a very fine line or thread of ground colour divides the pitchy-blackish plate on second segment, which is margined in front by a portion of the brown skin next the head.

Mr. Wood having kindly given me the result of his careful experience with these larvæ, I here quote from his advice :—

"I think they do best when the cone is kept on its side, and not standing on end. I have found them so far not difficult to rear. The only time when they want a little management is just after they have shed the last skin, or the last but one; should they at that time be out of their burrow, it is useless then to put them on an ordinary cone, as they will not make any attempt to eat into it, but wander about and would ultimately die. The plan is to get a dry cone, and break off some of the scales, so as to leave a rough surface; as soon as the larva is put upon this, all tendency to wander vanishes; it soon sets about spinning a hiding place, making it very secure, and taking plenty of time over it, for it is sometimes as much as thirty-six hours before it runs out a little covered way to the fresh cone that has been placed by the side of the other.

"It seems to be very impatient of exposure, more particularly when left feeble from the process of moulting, for it has been only at this particular time this care has been required. At an earlier age it is able to creep under a scale, and a few threads will complete the concealment."

I found the first larva when it left the cone wander about until it died, refusing to attack the fresh cone supplied to it. Mr. Wood then kindly sent me a cone containing two larvæ approaching maturity on the 12th of September, intimating that I might expect to see one of them out of the cone in about ten days' time in search of a place for spinning up. This was a most exact prognostication, for though I looked daily into the pot after it, and noted with satisfaction the increasing heap of brown frass that steadily accumulated at the bottom, yet no larva made its appearance till the afternoon of the 22nd, when I beheld it hanging down from the cone, apparently examining the smooth surface of the jam pot.

After taking the note of its size and appearance before recorded, and securing its portrait, I put it into a pot prepared with earth at the bottom, on which were placed a fresh cone and an old brown one, with some pieces of touch wood, and after it was placed on the old cone it examined the surface of the fresh one for a moment or two, and returning to the old one, descended to the peaty earth, over which it crept to the touch wood, amongst which it speedily disappeared.

The second inhabitant of the cone (now on the 28th) continued to feed, as evidenced by grains of frass continuing to accumulate at the bottom of the pot, beneath the hole by which its co-tenant had previously left it.

Mr. Wood tells me "that several larvæ will often agree together in a single cone, when probably they take care not to encroach on each other. I had no less than six in one cone; for some reason or other they had preferred it to others that were alongside. They will, however, fight sometimes. A full-fed fellow emerged one day, and as it was smaller than any of the others had been, I thought it might not have done feeding, and introduced it into an opening that was apparently tenantless; the animal went in readily enough to half its length, and then began to back out, which I tried to prevent, but it would not do, and the next moment the larva wriggled out and lay for an appreciable time twisting on the cone, held bull-dog fashion by the neck by another larva. Blood was drawn."

Fig. 23, 1877. In 1877, on September 7th, I received from Dr. Wood a spruce fir cone containing a much finer larva than either I had seen previously; it measured rather more than seven-eighths of an inch long, of rather stout figure, uniform in size, except that it tapered slightly from the third segment forward to the head the smallest, the 13th segment very slightly tapering.

In colour the head black-brown, plate on the second segment also with wide dorsal division of the same colour as the back of the larva, a rather reddish-brown, beneath the spiracles this colour is abruptly separated from the rather paler colour of the belly, most defined posteriorly; the dorsal line is rather darker brown, but on the 13th segment becomes obliterated by a broad pale stripe, relieved by a dark blackish-brown stripe on either side; on the back the tubercular dots are black, reddish-brown on the belly; ocellated spot of whitish, with black centres, on side of 3rd and 12th segments, with extra long hair and a fine brown hair from each dot.

This larva was observed out of the cone on September 14th, when I figured it, it was afterwards placed with the cone in a jam pot containing small fragments of rotten wood, and the moth emerged on June 14th, 1878.

On looking afterwards for the empty cocoon I found it at just the distance of one-fourth from the bottom, just inside the scales, at a part where they had been much ravaged or broken away; it was oval in form, five-eighths of an inch long, composed of whitish silk, but all (except the part attached to the cone) was entirely covered with brown frass. The pupa skin (damaged by extraction) seemed to have been about from a quarter to three-eighths of an inch in length, and of light reddish-brown shining colour.

On October 8th, 1879, I received an infested cone of spruce fir from Dr. Wood, drawing my attention to a singular feature in the economy of this species. Pinned to the cone I found a round flattish cocoon of white silk, partly covered with frass, containing a living larva of last year (1878) lying curled in a ring. This cocoon he tells me is a false or temporary cocoon, or hibernaculum, constructed simply for hibernation; and that when the larva intends to pupate, it will come out and form another, the true cocoon, of the usual oval shape. Dr. Wood affirms it to be the ordinary habit of this larva to form these two kinds of cocoons, although occasionally an individual is met with that dispenses with the round temporary one, and acts like the one I had in 1877, which produced the moth in June, 1878.

Last autumn (1878) Dr. Wood found an infested cone; it was put in a tin. On opening this in May, 1879, a larva was disturbed whilst making its pupating cocoon, and though this contretemps happened twice, it would not be baulked of its intention, and in good time produced the moth. On October 7th, when cleaning out this tin for something else, Dr. Wood found in one of the corners under a few loose scales three of the round flattish cocoons; one was empty, and had previously contained the larva whose history had just been given; another held a dead larva; and the third Dr. Wood kindly enclosed to me, which I received (together with an infested cone) October 8th, 1879.

This round, flattish case, containing a larva, I figured on October 23rd, and kept apart with a bit of an old cone quite dry of the year 1877.

The infested cone that came with it I also kept separate. In writing to Dr. Wood I expressed an opinion I had held for some time, that the small larvæ I had received from him late in autumn in former years could not be full grown, as they did not produce a moth, though I had kept them over two years; but that when a larva came from him to me much larger than any I had before seen, more than double the size of the others, that larva produced the moth. A fact which seemed to point to the larval life extending over two seasons.

To this Dr. Wood replied as follows:—

"It seems to me the question you have raised as to the length of the larval life of *abietella* is a very difficult matter. I told you all the larvæ do not form the round cocoons, and I think it is more especially the earlier and better fed ones that do not. This is in favour of your views, but against it is the unquestionable fact that the *full-fed* larvæ construct them. Then again, the insect I bred this summer occupied just such another cocoon; it deserted it in May, showed no desire to eat, but at once began to construct an ordinary shaped one in which to pupate.

"The impression conveyed to my mind by these facts has been, that at a comparatively recent time in the history of this insect it was a two years' feeder, making use of these round cocoons in the first year as hibernacula, but that, although it has now become a one year feeder, the memory of the old habit is not altogether lost, and is called into action perhaps by the lateness of the season or want of nutritiousness in the food, causing the larva to be somewhat imperfectly fed. But it is an intricate question."—*October* 11*th*, 1879.

A NEW SPECIES OF *CRAMBUS* FROM COLORADO.

BY T. D. A. COCKERELL.

Mr. Henry Edwards, of New York, has been kind enough to examine a box of moths collected by me last year, and, among several other species of interest, is a *Crambus* to which he appends the note "not described," and which I therefore characterize as follows:—

CRAMBUS ULÆ, *n. sp.*

Length, 9½ mill.; alar exp., 24 mm. Primaries warm yellowish-brown, suffused with a dark shade (inclining somewhat to reddish-brown) on costa, extending over about one-third of the wing. There is a slightly paler patch (1 mm. long) on the costal margin near the apex. Of the area below the dark shade, the inner three-eighths is pale yellowish-brown, sprinkled with blackish and with pale scales; beyond this there is an indistinct but rather broad oblique band, composed of an inner pale and an outer dark portion. External to this is another band, similar in proportions, but having the inner portion yellowish-brown and the outer pale. Then comes a pale greyish area, and then a third band, the zigzag band seen in other members of the genus; this is yellowish-brown, bordered with whitish internally, and having a broader but somewhat indistinct grey external border. Between this and the outer margin is a greyish-brown area. On the outer margin are eight dark grey spots, the first three being enclosed in the dark area of the upper part of the wing, and the last two being almost obsolete. Fringe pale greyish-brown.

Secondaries plumbeous-grey, slightly lutescent. Eyes grey. Palpi, head and thorax yellowish-grey. Abdomen grey, with the lower border of each segment pale yellowish-brown.

Under-side of wings pale grey, with a brownish tinge on the costal margin of primaries. Legs pale yellowish-grey.

Hab.: near Ula, Custer Co., Colorado, U. S. A., 1887.

Among the other Lepidopterous captures of the past year are a probably new *Alucita*, and undetermined species of *Agrotis*, *Cidaria*, and *Eupithecia*, as well as several interesting known forms. On August 4th I took *Nomophila noctuella* in Cottonwood Gulch, Saguache Co., adding another locality for this cosmopolitan insect.

The Chrysomelid beetle mentioned in connection with a case of mimicry on p. 214, has been submitted to Prof. C. V. Riley, and proves to be *Disonycha punctigera*, Le Conte.

West Cliff, Colorado:
March 15*th*, 1888.

Cecidomyia nigra, *Meigen*.—For some years past my Marie Louise pears have been much infested by Dipterous larvæ, which destroyed a great portion of the crop soon after the pears had set. On sending some of the little infested pears to Mr. E. Fitch, he informed me that they were inhabited by the larvæ of *C. nigra*, Mg., but that they had not been reared of late years, and that it was not known to which division of the genus *Cecidomyia* the insect belonged. The next year, 1886, I sent a supply of the pears to Mr. P. Inchbald, of Fulwith Grange, who is usually very successful in rearing Cecids and other Dipterous parasites. These infested pears are mentioned by him, Ent., Feb., 1887, p. 35, but he did not rear a single specimen the following spring. I therefore, last June, sent specimens to Mr. Inchbald, Dr. Meade, Mr. E. Fitch, and Miss Ormerod, hoping that one or more would be able to rear them. We had been much perplexed by Mr. Inchbald having reared a number of a species of *Sciara* and no *Cecidomyia*, and began to think that the larvæ must be a *Sciara*. But Miss Ormerod, on seeing the little larvæ, at once gave her opinion that they were undoubtedly the larvæ of a *Cecidomyia*. Seeing Mr. Inchbald's notice in the Entomologist, Professor Riley wrote to him from Washington and expressed a great interest in the subject, since a pear orchard in America had been suffering from what he had every reason to believe was the same insect. He also sent the "Report of the Entomologist for 1885," in which the insect is carefully described and figured in the larva, pupa and imago states. I therefore sent some of the pears infested with these larvæ to America, which the Professor found agreed most closely with those which he had described as *C. (Diplosis) nigra*, Mg., or *C. pyrivora*, Riley, if it was thought to be different from Meigen's species. No authentic specimens are in existence, while the description is somewhat vague. This spring, both Mr. Inchbald and Dr. Meade have reared the insect, the former in considerable numbers, and Dr. Meade has undertaken carefully to describe it. The habits of the insect are well given by several authors, but I have no books at hand to refer to. One of the earliest accounts in English will, I believe, be found in "A Treatise on Insects, by Vincent Kollar, translated by J. & M. Loudon, with notes by Westwood, London, 1840, pp. 292—295." Schmidberger's account is there given in full, and Professor Riley gives a long extract in his paper. I will, however, quote briefly from Professor Riley's own account, merely premising that in every particular it agrees with our insect so far as I have been able to observe. "The eggs are laid in the flower-end of the fruit even before it sets, the fruit grows and soon assumes a somewhat distorted appearance, occasionally seeming abnormally round," and, I may add, generally swells much faster than the uninjured fruit. "If one of these young pears be cut open, there will be found from ten to thirty little yellowish-white maggots, usually attaining their full growth before the interior of the pear has been entirely consumed. When full-grown they leave the fruit and drop to the ground. They burrow to a greater or less depth, depending on the porosity of the soil, but rarely exceed an inch. The larvæ progress by a series of skips and jumps by which they fling themselves an inch or more." For further particulars I would refer to the papers above-mentioned, and to Dr. Meade's forthcoming notice. Although the insect seems to prefer the Marie Louise pears it occurs also in other pears. It would be of interest to learn whether this Pear Midge is of general distribution in Britain.—E. N. Bloomfield, Guestling: *April 17th*, 1888.

Ephestia semirufa in Devon forty years ago.—It must be quite forty years ago that I used to take *Phycita semirufa* (as it was then termed). At that time my father and mother lived in a house in Old Market Street, Teignmouth: there were then, and are still, a row of houses with their backs to the street, and with the gardens belonging to them sloping down to the river Teign; the walls of our garden were thickly covered with ivy, evidently of many years' growth; from this we could always, in July and August, by beating, obtain one or more specimens of the *Phycita*, which was named for us by the kindness of the late J. C. Dale, *semirufa*, whether rightly or wrongly according to Haworth is doubtful. As the insect was much wanted by those with whom we corresponded, and to whose help we owed all our little stock of knowledge, many specimens were taken and distributed, but all, without doubt, bad, and set after the fashion of school boys. It varied much, but the ground colour was always more or less pale ochreous, or ochreous-grey. There was no food for it, such as an *Ephestia* would eat, save the rubbish on the wall under the ivy, or the birds' nests in it, but, in common with many other insects, notably *Triphæna janthina*, *interjecta*, *orbona* (*comes*), and *pronuba*, it used the ivy as a shelter. Once, I believe, we reared it in a store box of other *Lepidoptera*, where the larva was an unbidden guest, but this may possibly have been some other *Ephestia*. If the walls of the old gardens are still crumbling and grown over with ivy, no doubt the insect is as common as ever, but if they have been cleaned, swept, and garnished, with equal certainty *semirufa* exists there no longer. The only fruits which the larva could have used as a pabulum, save those of ordinary flowers, were the feathered achenia of a clematis which grew over the front of the house; *Lavatera arborea* and *Lycium barbarum* also grew more freely than is usual in gardens.—R. C. R. JORDAN, Harborne Road, Edgbaston: *April*, 1888.

Papilio bicolor, W. F. Kirby, = *P. Lesches, Godman and Salvin.*—The 4th part of Mr. H. Grose Smith's "Rhopalocera Exotica" (April, 1888), contains a figure of the *Papilio* recently described by Mr. W. F. Kirby as *P. bicolor.* This insect now proves to be the same as *P. Lesches* described by Mr. Godman and myself in 1880. Its synonymy stands thus:—

Papilio Lesches, Godm. and Salv., P.Z.S. (1880), p. 614.

P. bicolor, W. F. Kirby, Ann. and Mag. N.H. (5), xix, p. 361 (1887); Smith and Kirby, Rhop. Exot., Pap. iii, fig. 3, 4 (1888).

Our specimens were taken about thirty miles from Port Moresby, S.E. New Guinea, by Mr. Andrew Goldie.—O. SALVIN, London: *April 1st*, 1888.

Distribution, time of appearance, habits, size, &c., of the genus Selenia.—For Mr. Merrifield's information I may state that *illunaria* occurs commonly here, emerging in April and May, being large well-marked specimens, expanding from 1″ 6‴ to 1″ 8‴. Several years ago I bred two specimens of the small summer variety in August from larvæ beaten in June, and which I now have in my collection, expanse 1″ 1‴; whether the larva would have undergone its transformations, and the imago emerged during the summer in a state of nature, is doubtful, as I have never taken nor heard of the summer form being taken in this neighbourhood. *Illustraria* does not occur with us, but *lunaria* occurs sparingly. I, this year, collected two pupæ of this species, which I kept in a warm room, and two fine males emerged nearly a month ago—the usual time of appearance out of doors is, however, early in June. I would not like to speak with certainty, but my recollection of the position of the wings when at rest is that they met over the back like *illunaria.* I will, however, endeavour to find another pupa, and will note particularly their position, should I be fortunate in my quest and the insect emerge. Ours are all fine dark coloured specimens, approximating to *illustraria* in hue, and expanding 1″ 8‴, much darker than my specimens from the South.—J. GARDNER, 8, Friar Terrace, Hartlepool: *March 20th*, 1888.

Quedius longicornis, Kr.—I am glad to supplement the Rev. Canon Fowler's capture of a specimen of this rare beetle with that of other three specimens taken on our sandhills during last summer. I have recently had them returned from my friend Mr. Blatch, who has kindly named them for me, so that there is no doubt whatever as to their correct determination. This species is a valuable addition to the Northumberland and Durham list, not being recorded in Bold's *Coleoptera* of the two counties.—ID.

The specific characters of Aëpus marinus and Robinii.—The following observations of differences in the forms of the elytra of *Aëpus marinus* and *Aëpus Robinii*, noted by the writer of this paragraph, and confirmed by the Rev. Canon Fowler, will probably be found useful for the more easy determination of specimens of the *Coleoptera* in question, as a definite character is suggested for each insect.

i. Apex of elytra truncate, apical sutural angle rather more than a right angle .... MARINUS.

ii. Apices of elytra separately produced lobe-like, gaping; apical sutural angle obliterated .... ROBINII.

It may be furthermore remarked, that whilst the eyes of *marinus* are "small, sunk into the head," those of *Robinii* are moderately prominent, granulate.—J. KEYS, Plymouth: *April 7th*, 1888.

The Worm (?) *that devoureth.*—The accompanying article, which appeared under the above heading in "The Pharmaceutical Journal" of December 10th, 1887, has been sent to me as likely to prove interesting to readers of the Ent. Mo. Mag.; the study, as the Editor, in another place, allows is not superficially attractive, but it evidently may have its uses, and, in fact, is said to have been already utilized in judicial inquiries.

"An investigation that is going on in France as to the sanitary relations of cemeteries, which recently involved the exhumation of a number of bodies in the burial place at Ivry, has contributed some further information on the subject, that has been recently communicated to the Academy of Sciences by M. Mégnin.* The bodies exhumed, which had been buried for known periods ranging between two and three years, yielded a rich harvest of larvæ, pupæ, moultings, and even perfect insects of various species. Scientific identification of these has shown—as might be expected—that although the larvæ which fed on buried corpses are innumerable as individuals, the species are much fewer than of those which attack dead bodies exposed to the open air. Several species are common to both conditions, but some of them are evidently peculiar to the grave, and two of them were previously unknown. It has also become evident that the larvæ of the *Diptera* and *Coleoptera* play a most active part in the disintegration of bodies buried under ground, as they do in those exposed above ground, and that, as has been hinted before, the different species make their appearance in regular succession, not simultaneously. In the corpses that were exhumed after being in the earth two years, it was obvious that the *rôle* of the larvæ of certain Dipterous flies (*Calliphora vomitoria* and *Curtoneura stabulans*) had been long played out, it having commenced probably at the time of burial, if not before. These had been succeeded by the larvæ of another Dipterous species (*Anthomyia* sp.); whilst the larvæ of still another member of the same order (*Phora aterrima*) had been carrying on the work so recently that myriads of the insects were found still in the pupal stage, not having yet reached the perfect form. As to the *Coleoptera*, the larvæ of one species (*Rhizophagus parallelocollis*) were still in full activity. It is very curious to learn in respect to this insect that Entomologists had no knowledge previously of it in its larval form. The perfect beetle was known to be met with exclusively in the grass of cemeteries, but how little its true business there was suspected seems to be indicated by the generic name of "root eater" conferred upon it. Another curious observation that applies to the last-mentioned two insects is, that whilst the *Phora* larvæ were found feeding exclusively on lean corpses, the *Rhizophagus* larvæ seemed to be just as exclusive in their preference for putrescent adipose matter.

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* Comptes rendus de l'Académie des Sciences, T. cv, No. 20, 14, Nov., 1887.

The question naturally arises as to the manner in which these insects gain access to bodies, the majority of which are buried in sound coffins at a depth of more than six feet underground. There can be little doubt that even before burial the eggs of certain Dipterous flies are deposited in such parts as the nose and mouth and are buried with the body. This finds confirmation in the fact that bodies buried in the summer months afforded evidence of having fostered an abundance of the larvæ of flies that inevitably occur in the sick-room during warm weather, whilst bodies buried in the winter were free from any sign of them. As to access after burial, it was found that under the strain of the weight of the superincumbent soil, assisted by the influence of damp, the strongest and best made coffins soon gape sufficiently at their seams to afford ample room for an insect inroad. It is conjectured that in many cases, such, for instance, as that of the beetle already specially referred to, the perfect insect deposits its eggs near the surface of the soil, at a spot under which a marvellous instinct tells it the food required for its offspring will be found at the proper moment in a suitable condition. When the larvæ are hatched, they—probably also directed by the sense of smell—are supposed to make their way down through the earth to their food, after the manner that larvæ with other tastes find their way underground to truffles."

The author of this article is not correct in saying that *R. parallelocollis* is met with exclusively in the grass of cemeteries, as it has occurred in the London district in trees infested by *Cossus ligniperda*, and also in Sherwood and Dean Forests: at the same time it is a curious coincidence that a large number of specimens were once taken by Archdeacon Hey in fungi in York Cemetery in company with *Atomaria fimetarii*, and that Mr. Bold records it as not rare in the Northumberland and Durham districts on the walls and tombstones of graveyards; were it not for the positive statement that the larvæ were found actually in the corpses, I should be inclined to think that it was the wood of the coffins that formed the attraction, as wood buried at some distance in the ground will often be found to contain certain species, such as *Anommatus* and others; there are about thirty species of *Rhizophagus* known, and not one only, as the writer of the article seems to imply. I am not aware of any description of the larva of *R. parallelocollis*, but those of several other species are well known: they are mostly found under bark, and are said to devour the excrement of the larvæ of certain wood-feeding beetles with which they live, although they are to a certain extent carnivorous, and feed on the larvæ themselves. Some of them appear to bury themselves in the ground before undergoing their transformations, and this may be the case with all; the natural habitat of the perfect beetle is, however, certainly above ground. It seems curious that *R. parallelocollis* should be the only beetle referred to as infesting the coffins.—W. W. Fowler, Lincoln: *January 10th*, 1888.

Obituary.

Henry James Stovin Pryer, C.M.Z.S., died prematurely at Yokohama, Japan, on February 17th, 1888, after a very short illness from bronchial pneumonia. By his death, Entomology has lost one of the best and most observant of its resident votaries in Japan. He was the youngest son of Mr. Thomas Pryer, F.S.A., a London solicitor, and was born near Finsbury Square on June 10th, 1850. His father died before the subject of this notice was one year old, and it is reported that the youngest son was for many years of an extremely delicate constitution. H. Pryer's taste for Natural History developed early, and before he was eighteen he had formed a very considerable collection of British *Lepidoptera*. His brother, Mr. W. B. Pryer (now of British North Borneo), who is equally known as a naturalist, left England for China in 1865, and was followed by him in 1871; but H. Pryer's stay in China was short. He was offered a position in Japan, which became his home, for he never revisited Europe, but intended to do so this or next year. With the exception of a short time, during which he held an official position at the University of Tokio, Mr. Pryer was engaged in mercantile pursuits, and at the time of his death he was in partnership with Mr. James Bisset, F.L.S., also a naturalist, but more especially attached to Botany.

During his long residence in Japan, Mr. Pryer travelled over the greater part of the islands, and visited the Asiatic mainland. He also made an excursion to Borneo to meet his brother. And quite recently he explored the Loo-Choo (or Ryu-Kyu) islands, and engaged a Japanese collector to supplement his own researches. He did good work in all departments of Japanese Entomology, but especially so in *Lepidoptera*, upon which he published many notes both in Japan and here, sometimes marred by a slight absence of method. His biological observations on Japanese Butterflies are of the greatest importance. Quite recently he projected a Monograph of the Butterflies, under the title "Rhopalocera Nihonica," a work unique of its kind, executed entirely in Japan, with the text in the vernacular and in English. One part has appeared, and we understand the second (of the three proposed) was in the press at the time of his death.

Mr. Pryer apparently discovered the method of making himself popular both with the Japanese and the European residents. Many Englishmen have done (and will no doubt yet do) much towards the investigation of the Natural History of Japan; Mr. Pryer will not be forgotten at the reckoning. He joined the Entomological Society of London in 1867. In 1878 he was elected a Corresponding Member of the Zoological Society, in recognition of the services he had rendered by forwarding living Japanese animals to the gardens.

For some particulars as to his early life we have to thank his brother-in-law, Mr. P. C. Wormald.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY: *March* 22*nd*, 1888.—T. R. BILLUPS, Esq., F.E.S., President, in the Chair.

Messrs. E. Knight, C. J. Montague, J. E. Lloyd, W. Roots, and R. Pierpoint were elected Members.

Mr. R. South exhibited a specimen of *Polyommatus Phlæas*, L., with ocellus on under-surface of left wing similar in character to the marginal ocelli on the under-surface of anterior-wings, and an example of *Papilio Bianor*, with a patch of the colour and ornamentation proper to the under-surface of hind-wings on the under-surface of the right fore-wing. The *Polyommatus* was captured by Mr. South in N. Devon, 1881, and the *Papilio* by Mr. Leech's collector in China, 1887. Mr. Tutt, specimens of *Leucania impudens*, Hb., taken by Mr. W. Farren, of Cambridge, one closely resembling Hübner's grey type, one the var. *striata* of Staudinger, one resembling Hübner's figure of *pudorina*, the others being intermediate forms. Mr. White, preserved larvæ, also imagines of the genus *Acronycta*, for the purpose of exhibiting the difference of character in the larvæ, and the close resemblance of the moths, which he stated was so strong in the well-known instance of *A. tridens* and *A. psi*; Mr. White said he should be pleased to receive ova of any species of this genus for the purposes of studying the affinity of the group, it would be interesting to ascertain if the larvæ varied in the different stages, and whether there was a much closer resemblance in the final stage. Mr. South remarked that in the earlier stages the larva of *A. psi* could not be separated from the larva of *A. tridens*. Mr. J. Jenner Weir exhibited British and Continental specimens of *Euchloë cardamines*, L., and remarked that he had observed for some years a difference between the latter, so far as he had been able to examine them, and those captured by himself in Kent, Surrey, Sussex and Hampshire. Those captured in these counties had the orange spot on the upper-wings reaching but slightly beyond the discoidal black spot, the inner edge curving outwards, not extending beyond the first median nervule, thus leaving the hinder angle white; this disposition of marking he found perfectly constant in those captured. In the Continental specimens the orange spot extended considerably beyond the discoidal spot, and was continued to the inner edge of the wing, causing the hinder angle to be orange. The distinction pointed out was very small, but if it was constant, our *E. cardamines* was an insular variety easy separable from Continental specimens. Mr. Tutt read a paper, "The Morphology and Physiology of an Insect," which was followed by a discussion.

April 12*th*, 1888: the President in the Chair.

Mr. Slater exhibited a *Bombyx* from Zulu Land, which he said approached nearest to *B. oubie*, taken by M. Guerin in South Abyssinia, and might be a local variety of that species, if not, it was a new species. Mr. John Lea, varieties of *Tæniocampa munda*, Esp., light specimens without the twin black spots. Mr. Henderson, forms of *Satyrus Semele*, L., *Cucullia verbasci*, L., from various localities, with a view of illustrating the local variation of the species. Mr. R. Adkin, bred specimens of *Pygæra anachoreta*, Fb., from the neighbourhood of Saltwood Castle. Mr. J. T. Carrington thought that the species was no doubt introduced to this country with the Balsam poplar. Mr. Tugwell, grey and black forms of both sexes of *Nyssia hispidaria*, Fb., which he stated were all bred from one batch of eggs, there was, however, very little variation in the larvæ. Mr. Jenner Weir exhibited specimens of *Pieris brassicæ*, L., from St. Petersburg, lat. 60°, Lewes and Blackheath, between lat. 50° and 52°, Hyères, lat. 43°, and remarked that the species did not differ from places so remote, either in marking or in size. Mr. T. R. Billups, a living specimen of the genus *Aspidimorpha*, which he said was an apparently new species, and was brought from Upper Burmah amongst the roots of an orchid, *Dendrobium brymerianum*.

The Secretary read a note from Mr. T. D. A. Cockerell, with reference to an exhibit of a new rose-gall from Custer, Co. Colorado, which had been pronounced by Mr. L. O. Howard, of the U. S. Department of Agriculture, to be the product of an undescribed species, *Rhodites tuberculator*, Riley.—H. W. Barker, *Hon. Sec.*

Entomological Society of London: *April 4th*, 1888.—Dr. D. Sharp, F.Z.S., President, in the Chair.

The Rev. J. H. Hodson, B.A., of Torquay, Devon; Mr. A. J. Croker, of New Cross, S.E.; Mr. G. C. Griffith, of Cotham, Bristol; and Mr. Albert H. Jones, of Eltham, Kent, were elected Fellows.

Mr. H. Goss exhibited a large number of insects lately received from Baron Ferdinand von Mueller, K.C.M.G., F.R.S., of Melbourne, which had been collected by Mr. Sayer on Mount Obree and the adjoining ranges in New Guinea, during Mr. Cuthbertson's recent expedition there under the direction of the Royal Geographical Society of Australia. The collection comprised species of *Coleoptera*, *Lepidoptera*, *Hemiptera*, *Diptera*, *Hymenoptera*, and *Orthoptera*. The *Lepidoptera*, included twenty species of butterflies belonging to the genera *Calliplæa*, *Chanapa*, *Hamadryas*, *Melanitis*, *Mycalesis*, *Hypocysta*, *Tenaris*, *Hypolimnas*, *Cyrestis*, *Neptis*, *Acræa*, *Danis*, *Pithicops*, *Appias*, *Ornithoptera*, *Eurycus*, &c.

Mr. Osbert Salvin, F.R.S., exhibited, and made remarks on, about sixty specimens—no two of which were alike—of a species of butterfly belonging to the genus *Hypolimnas*, all of which had been caught by Mr. Woodford near Suva, Viti-Levu, Fiji, on one patch of Zinnias.

Mr. H. T. Stainton, F.R.S., exhibited, on behalf of Mr. G. C. Bignell, cases of *Thyridopteryx ephemeræformis*, Haworth, collected near Charlestown, U.S.A. Mr. Stainton said he hoped Mr. Bignell would not introduce this pest into England.

Mr. W. F. Kirby exhibited, and read notes on, about twenty species of South African Dragon-flies lately received from Mr. Roland Trimen, F.R.S., of Cape Town, Mr. Kirby said the collection included some new species.

Mr. A. Sich exhibited a bred specimen of a variety of *Plusia gamma*.

Mr. Goss read a letter from Mr. Bignell, correcting a statement made by Mr. Poulton at the March meeting of the Society to the effect that the variety *Valezina* of the female of *Argynnis Paphia* did not occur in Devonshire. Mr. Bignell said that the var. *Valezina* was included in Mr. Reading's "Catalogue of Devonshire *Lepidoptera*;" and that he had himself taken specimens of it in Bickleigh Vale, Devon.

Mr. Waterhouse read a paper entitled "Additional Observations on the Tea-bugs (*Helopeltis*) of Java," and exhibited a number of specimens of these insects. He said that the species infesting the Cinchona in Java was supposed to have been introduced from Ceylon in tea, but that he had discovered that the species on the Tea and on Cinchona in Java were distinct, and that both species were distinct from *Helopeltis Antonii* of Ceylon.

Mr. Jacoby read a paper entitled "New, or little-known, species of Phytophagous *Coleoptera* from Africa and Madagascar."

A letter was read from Mr. E. C. Cotes, of the Indian Museum, Calcutta, asking for the assistance of British Entomologists in working out certain groups of *Coleoptera*, *Neuroptera*, *Orthoptera*, *Diptera*, and *Hymenoptera* in the Indian Museum. A discussion ensued, in which Mr. McLachlan, F.R.S., Dr. Sharp, Mr. Waterhouse, Mr. Jacoby, and Mr. Distant took part.—H. Goss, *Hon. Secretary*.

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